

H.Channon Company.

Chicago.

Catalogue Number 50

Concentrate your purchases



250
H. Channon Company.
Market and Randolph Sts.
Chicago



DISCOUNT SHEET
FOR
CATALOG No. 50
AND
SUPPLEMENT
OF
Supplies and Machinery
MAY 1, 1911

THE SUPPLEMENT WHICH ACCOMPANIES THIS DISCOUNT SHEET CORRECTS ERRORS FOUND TO EXIST IN OUR CATALOG No. 50 AND GIVES ALL NEW LISTS TO DATE OF GOING TO PRESS. THE DISCOUNTS ARE REVISED AND BROUGHT TO DATE, BUT OWING TO CONSTANT CHANGES IN THE MARKET, PRICES QUOTED HEREIN ARE NOT GUARANTEED AND WE RESERVE THE RIGHT TO BILL OUT ALL GOODS AT PREVAILING MARKET PRICES.

YOUR INQUIRIES AND ORDERS WILL AT ALL TIME RECEIVE OUR PROMPT AND CAREFUL ATTENTION.

**We are Agents for the following
well known Manufacturers**

J. S. MUNDY, Hoisting Engines.

A. S. CAMERON STEAM PUMP CO., Steam Pumps.

HAYWOOD COMPANY, Orange Peel and Clam Shell Buckets.

WITTE GAS ENGINE COMPANY, Gasoline Engines.

AMERICAN STEEL & WIRE CO., Wire Rope and Wire Products.

**KILBOURN & JACOBS MFG. CO., Wheelbarrows, Plows, Scrapers
& Trucks.**

NEW YORK RUBBER COMPANY, Mechanical Rubber Goods.

**CHAMPION BLOWER & FORGE CO., Portable & Stationary Forges
& Blowers.**

YALE & TOWNE MFG. COMPANY, Chain Blocks and Electric Hoists.

WHITMAN & BARNES MFG. CO., Drills, Reamers and Wrenches.

BAY STATE TAP & DIE CO., Threading Tools.

BROWN & SHARPE MFG. CO., Mechanics' Tools & Milling Cutters.

L. S. STARRETT CO., Mechanics' Tools.

**NICHOLSON FILE COMPANY, Great Western & "X-F." Swiss
Pattern Files.**

NORTON COMPANY, Grinding Wheels and Machinery.

AMERICAN SAW MILL MACHINERY CO., Saw Mill Machinery.

CRESCENT MACHINERY CO., Woodworking Machinery.

COATES CLIPPER COMPANY, Flexible Shaft Appliances.

EDWIN H. FITLER CO., Manila and Sisal Rope.

JACKSON SHOVEL & TOOL CO., Shovels, Spades, Scoops, etc.

DIAMOND SAW & STAMPING WORKS, Sterling Hack Saw Blades.

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
818	BLOWERS:		BLACKSMITH'S ANVIL TOOLS:
	No. 400 Series Champion Steel	828	Swages, Top and Bottom..... 70%
	Blacksmiths' 50-10%		Fullers, Top and Bottom..... 70%
	Champion Electric and Hand-		Cutters, Hot and Cold..... 70%
	Power Blacksmiths'.....each 60.00		Flatters 70%
	Lancaster Geared Blacksmiths'. 50%		Set Hammers 70%
	FORGES:		Hardies 70%
819	Champion:		Center Punches.....each 25c
	Entire Page 50-10%		Punches 70%
820	Channon Midway 50-10-5%		Heading Tools 70%
	Ratchet Lever 70%	829	ANVILS:
821	Royal Western Chief..... 50-10-5%		Columbia Base, lb. 9c
	Champion Electric Driven Black-		Vulcan 40%
	smiths':		Peter Wright's lb. 10 1/2 c
	No. 440 each 42.50		Peter Wright's Farriers' lb. 11c
	ever: each 37.50	830	Special Blacksmiths' Outfit..... 40%
	Fig. 30 each 4.50	831	Special Blacksmiths' Outfit..... 40%
	Figur 51 each 5.00	832	Whitewashing Machines:
	Star Portable Bellows.....each 20.00		Style A.....each 30.00
	Gunnell Pneumatic each 15.00		Style D.....each 20.00
	Buffalo Compressed Air..... 40%		Style E.....each 30.00
823	Stationary Down Draft (f. o. b.		Style J.....each 9.00
	Buffalo, N. Y.)..... 45%	833	Sheet Iron Roofing, Entire Page. Market
	Champion Steel 50-10%	834	Lead Roofing Washers..... Market
824	BELLOWS:		Barbed Roofing Nails..... Market
	Blacksmiths' Standard or Extra	835	ROOFING:
	Long:		Monarch:
	Split 60%		2 Ply sq. ft. 2.00
	Grain 50%		3 Ply sq. ft. 2.50
	Hand 40%		4 Ply sq. ft. 3.00
	Angle Benders, Hand Power..... 25%		Waterproof Composition Rubber:
	Extra Dies 25%		1 Ply sq. ft. 1.25
825	Shrinkers:		2 Ply sq. ft. 1.50
	Western Chief Tire and Axle		3 Ply sq. ft. 1.75
	No. 1 each 25.00		Crushed Stone or Gravel. sq. ft. 2.75
	Improved Mole Tire:		Composition Paint or Coating.... Appl.
	No. 1.....each 6.00		Roofing Cement Appl.
	No. 2.....each 8.75		Metal Paint Appl.
	No. 3.....each 11.00		Rosin Sized Sheathing..... Appl.
	Champion Tire and Axle.....each 8.00		Blue Plaster Board..... Appl.
	TIRE BENDERS:	836	Tar and Asphalt Tools, Entire
	No. 1.....each 4.00		Page 10%
	No. 2.....each 4.75	837	Mogul Stoves:
	No. 2 1/2.....each 5.75		(See Supplement) Net
826	TUYERE IRONS:	838	LAWN MOWERS:
	Warren's Patent..... 35%		Boughton:
	Norton's Patent..... 35%		16-inch each 8.00
	Duck Nests..... 35%		18-inch each 9.00
	Champion:		20-inch each 9.50
	Heavy Nest, No. 400 5 - inch		Van Kleeck:
	Deep, 8 1/4-inch Wide, 10 1/2-		16-inch each 5.50
	inch Long. Over all 12 3/4-		18-inch each 6.00
	inch by 14 1/4-inch.....each 4.00		Harrison:
	Patented Adjustable Nozzle,		14-in., each \$3.75 16-in., each 4.00
	.....each 1.25		TENTS:
	Blacksmiths' Pincers 50%	839	Wall Tents 30-5%
	TONGS:	840	Wall Tents 30-5%
	Straight Lip 80%	841	Sibley Tents 30-5%
	Bolt 70%		"A" or Wedge Tents..... 30-5%
	Gad 65%		Miners' Tents 30%
	Pick-Up 65%	842	Wigwams 25%
	Pick 65%	843	Family Compartment Tents..... 50%
	Lathe Tool 50%	844	Entire Page 50%
827	SLEDGES:	845	Entire Page 50%
	Cross Pein 75%	846	Amazon Tents 50%
	Double Face 75%		Lumbermen's or Herders' Tents 40%
	Hammers and Sledges, Entire Page 75%	847	Stable Tents 40%

Page Catalogue	Discount or Net Price	Page Catalogue	Di Ne
848	CANVAS PAULINS:	FLAG POLES	
	5½ x 9 to 12 x 14.....	Heavy	
	12 x 16 to 14 x 20.....	Flag Staffs	
	Larger Sizes	865 Entire Page	
		866 Entire Page	
		867 Entire Page	
849	WAGON COVERS:	868 GRASS CATCHERS:	
	Achilles	Iron Clad	
	Waterproof Gullwing Duck....	Favorite	
	Heavy Wide Duck.....	Carroll Adjustable Awnings.....	
	Perfect Fit Binder Covers.....	Sidewalk Canopies	
	Painters' Drop Cloths.....	869 Entire Page	
	Old Canvas	870 RUBBER BOOTS:	
850	Entire Page	First Quality	
		Second Quality	
851	HAMMOCKS:	Rubber Gloves	
	Solid Comfort	871 Entire Page	
	Mexican Sea Grass.....	872 Entire Page	
852	"Dreamland" Swaying Hammock	873 Entire Page	
	Couch	874 Entire Page	
853	"Dreamland" Swaying Hammock	875 Entire Page	
	Couch	876 COTS:	
854	Plumbers' Tool Bags.....	Folding Canvas	
	Canvas Messenger Satchels.....	Folding Wire	
	Ore Sacks	BAGS:	
	Masons' Tool Bags.....	Dunnage	
	Linemen's Tool Bags.....	Sailors'	
	Letter Carrier's Satchels.....	Sleeping Bags	
855	BAGS:	Clothing and Provision	
	Carry-All	Extra Heavy	
	Leather Office Mail.....	877 Laundry Bags	
	Leather Hand	Canvas Fire Pails.....	
	Canvas Hand	Pack or Ground Cloths.....	
	Mail Pouches	Polishing Mittens	
856	Entire Page	Canvas Gloves and Mitts.....	
857	Coal Bags	Window Washers' Belts.....	
	Canvas Aprons	878 Entire Page	
	Newspaper Bags	879 Entire Page	
858	American Litter	880 ANCHORS:	
	Solid Block Cork Life Preservers	Kedge:	
	Three Bow Seat Shades.....	4 to 10 lbs.....	
	Umbrellas	12 to 20 lbs.....	
859	Entire Page	Dirigo Folding	
860	Entire Page	Stockless	
861	Entire Page	881 Row Locks, Entire Page.....	
862	Entire Page	882 Entire Page (Revised List see Sup-	
863	Entire Page	plement)	
864	Railroad Signal Flags	883 Entire Page	
	Flag Pole Holders	884 Entire Page (Revised List see Sup-	
	Flag Staff Holders	plement)	
		885 Entire Page	

ADDENDA

TROWELS:

Brick.
Pointing.
Plastering.

See Supplement

DISCOUNT SHEET

*FOR

General Catalog No. 50

Of Special Interest to the Buyer of Machinery and Supplies for Steam Railroads, Electric Railroads, Contractors, Bridge Builders, Stone Quarries, Machine Shops, Factories, Mines, Blacksmiths, Saw Mills, Paper Mills, Flour Mills, Cotton Mills, Elevators, Electric Light and Power Plants, Municipal and Government Work.

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

Page Catalogue		Discount or Net Price
6	Mundy Engines (State size wanted) Appl.	
7	Mundy Engines (State size wanted) Appl.	
8	Mundy Belt Hoists 25%	
	Mundy Swinging Engines Appl.	
9 to 20	Mundy Hoisting Engines (State size and style wanted) Appl.	
21	Jackson Reversing Valve Engines. 15%	
22	HOISTS:	
	Eclipse:	
	No. 22 each 205.00	
	No. 23 each 270.00	
	No. 24 each 325.00	
	Class B:	
	No. 12B each 350.00	
	No. 13B each 415.00	
	No. 14B each 525.00	
23	Witte Gasoline 20%	
24	Mundy Gasoline Appl.	
25	Drilling Machines Appl.	
26	Friction Belt Hoists 30%	
	MINERS' WHIMS:	
	One Horse each 115.00	
	Two Horse each 175.00	
27	Horse Power Hoisters 20%	
28	Stump Pullers 20%	
	CAPSTANS:	
29	Hand 10%	
	Steam Appl.	
30	House Moving Trucks 5%	
	Maple Rollers 30%	
	WINCHES:	
31	Junior each 8.50	
	Worm-Geared each 8.00	
	Little Dandy each 10.50	
	Hercules each 19.50	
	Wagon 10%	
Sup- 32	Entire Page 33 1/3%	
33	Entire Page 33 1/3%	
	Fitted with Winch Head, extra each 11.00	
34	No. 18 25%	
	No. 28 15%	
	No. 185 10%	
	No. 280 10%	
35	No. 20 Junior Winch—not listed. Capacity 1500 lbs. with two men. Single Line, Wood	21.00

Page Catalogue		Discount or Net Price
	WINCHES, No. 20 Junior—Cont'd.	
	No. 20 15%	
	No. 25 10%	
	No. 26 5%	
	No. 27 15%	
36	Entire Page 10%	
	ELEVATORS:	
37	No. 46 Hod 20%	
38	Material 33 1/3%	
39	Mundy Engines Appl.	
	GASOLINE HOISTS:	
	Four-Horse Power each 330.00	
	Six-Horse Power each 360.00	
40	DUMB WAITERS:	
	Little Dandy 20%	
	Geared 20%	
	Hand Power Elevators Appl.	
41	Entire Pages Appl.	
42		
	PILE DRIVERS:	
43	Contractors' 25%	
44	Township 25%	
45	DROP PILE HAMMERS:	
	600 lbs. and under lb. .03 1/2	
	700 to 800 lbs. inc. lb. .03 1/2	
	1000 and under 1500 lbs. lb. .03 1/2	
	1500 and under 3000 lbs. lb. .03	
	3000 and over lb. .02 3/4	
	Dies or Pins are Extra—See below.	
	Dies or Pins:	
	Weight Hammer.	
	Steel Triangular Die, Fitted in Hammer	Steel Turned Pin, Fitted in Bored Hole
	600 lbs. and under \$1.50	...
	700 and 800 lbs. 1.50	...
	1000 and under 1500 lbs. 1.75	2.50
	1500 and under 3000 lbs. 3.00	3.00
	3000 lbs. and over 3.50	3.50
	Nippers 45%	45%
	Adjustable Trips 45%	45%
46	Entire Page 45%	45%
47	Entire Page Appl.	45%
48	Entire Page 45%	45%
	(Correct List on 4x4 Square Pile Points or Shoes to \$1.50 each.)	
49	Entire Page 45%	45%
50	Entire Page 45%	45%

Page Catalogue		Discount or Net Price	Page Catalogue		Discount or Net Price
51 to 54	Concrete Mixers	Appl.		DRILLS:	
55	Reinforcing Steel and Wire	Appl.		Pierce Hammer	List
	No. 3 Concrete Cart.....each	\$18.00		For 1/4-inch Bolts	each \$ 6.28
	(Also see Cart on Page 789.)			For 3/8-inch Bolts	each 6.68
				1/2x4 Drill Points for 1/4-inch Bolts	86
				5/8x6 Drill Points for 3/8-inch Bolts	1.26
				5/8x12 Drill Points	1.58
				3/4x 6 Drill Points	1.48
				3/4x12 Drill Points	1.78
				7/8x 6 Drill Points for 1/2-inch Bolts	1.58
				7/8x12 Drill Points	1.90
				Discount from above list	
				In single lots	30-10%
				In lots of 6 or more	50%
56	Buckeye Kerosene	20%	83	Grab Hooks and Chains.....	25%
	B. & W. Gasoline	20%		Derrick Foot Hooks and Chains..	20%
				Derrick Grab Hooks, only.....	30%
	STIFF-LEG DERRICK IRONS:			STONE SETTERS' GRABS:	
58	No. 3	15%		1/2 ton.....each	6.50
59	No. 2	15%		3/4 ton.....each	7.00
60	No. 1	15%		1 1/4 ton.....each	8.00
61	No. 9	Appl.		2 ton.....each	8.75
62	No. 13	Appl.		3 ton.....each	10.25
	DERRICKS:			STONE TONGS:	
63	Steel	Appl.		Made to Order only; state Ca- pacity and Spread wanted..lb.	12
64	Scow	Appl.		Beam Clamps	20%
	GUY DERRICK IRONS:			84 to 87	SCRAPER EXCAVATORS
65	No. 1	15%			Appl.
66	No. 2	15%		BUCKETS:	
67	No. 3	15%	89	Orange Peel (f. o. b. factory)....	35%
	DERRICKS:		90	Clam shell (f. o. b. factory)....	35%
68	All Steel Guy	Appl.	91 } Entire Pages		Appl.
69	No. 25 Breast	10%	92 }		
70	Union Builders':		93	Coal	25%
	No. 1	each 35.00	94	Contractors'	35%
	No. 2	each 45.00		Coal	25%
	Ontario Builders':		95	Bottom Dumping	30%
	See Supplement Page 2.....	Net		Turnover	15%
71	No. 17 Sulky	10%	96	Excelsior (f. o. b. New York)..	30%
	No. 27 Tripod	10%		Excelsior (f. o. b. Chicago)....	25%
72	Folding Tripods	10%	97	Cyclopean	15%
73	Foundation Winch Heads..each	16.50	98	Stuebner Concrete	25%
74	Derrick Bull-Wheels	10%		Ore:	
	Fig. 840 Guide Sheaves.....	30%		Fig. 154 Fig. 153	
				No. 1	each 18.00; each 19.50
				No. 2	each 23.00; each 24.00
				No. 3	each 28.00; each 29.00
				No. 4	each 32.00; each 34.00
				Mining:	
				Nos. 142 to 150.....	15%
				Water	10%
	DERRICK IRONS:			BOILERS:	
75	Entire Page	10%	99 }		
76	Entire Page	10%	106 }	Entire Pages	Appl.
77	Entire Page	10%		(Specify Size and Style Wanted.)	
78	Entire Page	10%	107	Vertical:	
79	Entire Page	10%		Nos. 0 to 9.....	35%
80	Truss Rods	25%		Nos. 10 to 12.....	45%
	Turnbuckles, See Page 625.		108	Submerged Tube	Appl.
	Guy Tighteners	35%		WATER HEATERS (Revised List See Supplement.)	
81	Gibson Guy Grippers	50%	109	Tabasco	45%
	Tramway Rollers	15%		Tabasco Junior	40%
	Derrick Skips	Appl.	110	Wilkes':	
82	Lewis	30%		Small Sizes	Appl.
				With Magazine	Appl.
	PLUGS AND FEATHERS:		111	Heating	Appl.
	3 -inch	doz. 1.00			
	4 1/2-inch	doz. 1.60			
	6 -inch	doz. 1.90			
	8 -inch	doz. 2.85			
	STONE WEDGES:				
	Hard Stone	lb. .10			
	Sandstone	lb. .20			
	DRILLS:				
	Ball	each 2.85			
	Rose and Star:	Each. Doz.			
	1/4x 8	30c 3.00			
	3/8x10	35c 3.60			
	1/2x12	40c 4.00			
	5/8x14	45c 4.50			
	3/4x16	60c 6.00			
	7/8x16	70c 7.20			
	1 x16	75c 7.50			

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
112	RADIATORS:	132	Witte Gasoline 25%
	Single Column Appl.	135	(Revised List See Supplement.)
	2 and 3 Column Appl.	136	Vertical Gasoline 35%
	4, 5 and 6 Column Appl.		No. 3 Pumping Outfit 35%
113	Sugar Kettles 40%	137	Motors and Generators Appl.
	CALDRONS:	140	
	Under 75 gal. 30%	141	No. 85 LIGHTING SETS (Revised List See Supplement).... Net
	75 gal. and over 25%	142	INCANDESCENT LIGHTS:
	Farm Boilers 30%		Standard:
	Steel Boilers 30%		Less than 200 Net
114	Steam Jacket Kettles 20%		200 or more 10%
	Lead Furnaces 10%		Mill Type: 100 to 130 Volts:
115	Feed Cookers 25%		Less than 200 Net
	Lark Kettles 25%		200 or more 10%
116	Air Receivers Appl.		Mill Type: 200 to 260 Volts:
	Steel Tanks Appl.		Less than 200 Net
117	Breechings and Stacks Appl.		200 or more 10%
	GRATES:		Tantalum:
118	Century sq. ft. 3.25		Less than 100 Net
	Simplex.		100 or more 10-10%
	Light Pattern, Complete, sq. ft. 2.00		Mazda Tungsten Filament:
	Heavy pattern, Complete, sq. ft. 2.75		20 C. P. 25W .65
119	Boiler Fronts lb. .04%		32 C. P. 40W .70
	PLATES:		48 C. P. 60W 1.00
	Top Liner lb. .04		80 C. P. 100W 1.35
	Side Liner lb. .04		In full packages. 15%
	Front Angle or Dead lb. .04 1/4		Type 650 Arc Lamps each 25.00
	BARs:		Extra 1/2x12 Electra Carbons
120	Center Bearing lb. .0334		per 100 4.25
	Back Angle lb. .0334		Extra Inner Globes doz. 2.50
	BACK SKELETON ARCHES:		Extra Outer Globes each 1.25
	36-inch each \$ 7.50	143	Rubber Covered Wires:
	42-inch each 9.00		(Discount about 50%) Market
	48-inch each 10.50		LAMP CORDS: 45%
	54-inch each 12.00		(Revised List See Supplement.)
	60-inch each 13.50		Porcelain Tubes 45%
	66-inch each 15.00	144	FLEXDUCT AND CIRCULAR LOOM:
	72-inch each 16.50		(Revised List. See Supplement.)
	Wall Binders lb. 4c		Porcelain Knobs 45%
	GRATE BARS:		B. & D. ONE-WIRE CLEATS:
	Shaving lb. 4 1/2c		(See New List, Supplement).... 50-10%
	Common lb. 4c		EDISON PLUG CUT-OUTS 65%
	Obtuse lb. 4 1/2c		Plug Fuses Appl.
	Fine Space lb. 4 1/2c	145	ENCLOSED FUSE CUT-OUTS
121	Improved lb. 4c		AND FUSES:
	McGinniss discontinued		Less than Standard Package... 50%
	Round lb. 4 1/2c		Standard package 50-10%
	Foundation Washers lb. 4 1/2c		SOCKETS AND RECEPTACLES:
	Bases for Boilers lb. 5c		No. 9366 Sockets each 8 1/2c
	MANHOLE:		No. 43310 Sockets each 9 1/2c
	Collars lb. 4 1/2c		No. 9407 Receptacles, less than
	Plates lb. 4 1/2c		Standard package 45%
	Crabs lb. 4 1/2c		No. 9386 Sockets, less than
	Lugs lb. 5c		Standard package 40%
	HANDHOLE:		Balance of Items, less than 1/2
	Plates lb. 6c		Standard package 35%
	Crabs lb. 6c		Balance of Items, 1/2 Standard
	Lug Plates lb. 4 1/2c		package to full package.... 40%
	HEATERS:	146	Meso Current Taps 45%
122	New Water Tube 40-5%		Separable Attachment Plugs..... 45%
	Standard 50%		Pony Rosettes 45%
123	Stillwell 40%		Separable Wireless Clusters..... 40%
	Springfield 45%		Complete Wireless Clusters..... Appl.
124	Dean Cleaners 20%		Wire Lamp Guards..... 45%
	ENGINES:		No. 9165 Socket Plugs.... per 100 60c
	Bullock:		Soldering Sticks 45%
125	Vertical Engines 40-5%		Tapes 45%
126	Combined Engines and Boilers 40%		
	Horizontal Engines 40%		
127 to } Entire Pages Appl.			
131 }			

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
RED SEAL BATTERIES:		PUMPS—Continued:	
No. 2445A, less than 12.....each	30c	161 to 163 } Electric	Appl.
No. 2445A, 12 to 50.....each	25c	164 } Vertical Centrifugal	45%
No. 2446	40c	165 } Shafting	45%
No. 2447	50c	165 } Split Bearings	40%
147 TYPE H SWITCHES:		165 } Jaw Couplings	35%
Nos. 11,745 to 11,749, incl.....	55%	165 } Set Collars	70%
Nos. 11,750 to 11,755, incl.....	35%	166 } Horizontal Centrifugal	50-5%
PORCELAIN BASE SWITCHES	60%	167 } Centrifugal:	
(Revised List See Supplement.)		167 } Fig. 870	50-5%
STANDARD 250 VOLT SNAP SWITCHES:		167 } Fig. 900	35%
(Revised List See Supplement.)		168 to 170 } Entire Pages	Appl.
Less than Standard packages..	40%	171 } Ejectors, See Page 740	
Switchboards	Appl.	172 } Lucas:	
PUMPS:		172 } Nos. 1 to 6	25%
148 Cameron: (f. o. b. New York.		172 } Nos. 7 to 9	30%
New York freight added when		172 } Nos. 11 to 12	35%
shipped from our Chicago		172 } Bestyett	30%
stock.)		173 } Channon Diaphragm:	
Sizes 0 to 10A.....	45%	173 } Side Suction No. 1 Pump, only	\$ 9.50
Nos. 10, 11 and 12.....	35%	173 } Side Suction No. 2 Pump, only	13.50
Boiler Feed	45%	173 } Side Suction No. 3 Pump, only	30.00
Light Service	45%	173 } Bottom Suction No. 1 Pump	
150 Removable Bushing Pattern:		173 }	only 9.00
Sizes Nos. 0 to 10A.....	45%	173 } Bottom Suction No. 2 Pump	
Single Compound	Appl.	173 }	only 13.00
Entire Page	Appl.	173 } Bottom Suction No. 3 Pump	
Entire Page	40%	173 }	only 26.50
Entire Page	40%		
151 Duplex Boiler Feed:		Hose:	
152 General Service Pumps "Deane"		Special High Grade Suction Hose	
153 of (Holyoke).		complete with couplings and	
154		clamps; Hose carried in 12, 15	
		and 20 ft. sections:	
		2½-inch Diameter	ft. \$1.25
		3 -inch Diameter	ft. 1.50
		4 -inch Diameter	ft. 2.50
		Strainers:	
		Iron:	
		2½-inch	each \$1.25
		3 -inch	each 1.65
		4 -inch	each 2.50
		Brass:	
		2½-inch	each 4.00
		3 -inch	each 4.75
		4 -inch	each 9.00
		Standard No. 2 Outfit, complete	
		with 12 ft. of Hose, etc.....	35.00
		Standard No. 3 Outfit, complete	
		with 12 ft. of Hose, etc.....	65.00
		174 } Diaphragm Pump Repairs	25%
		Extra Diaphragms only for Channon	
		Pumps:	
		No. 1, 2-inch	each \$1.50
		No. 2, 3-inch	each 2.00
		No. 3, 4-inch	each 3.00
		Manhole:	
		No. 0	\$22.00
		No. 1	27.50
155 to 156 } Entire Pages	Appl.	175 } Gasoline Driven	
157 } Emerson, Nos. 1 to 6.....	20-5%	175 } Trench Pump.	
Emerson Junior:		(See Supplement.)	
Size A	Appl.		
Size B	Appl.		
158 } Pulsometer	12¼%		
159 } Nye Vacuum Steam.....	20%		
159 } Humphrey's Hydraulic Rams...	25%		
159 } Niagara Hydraulic Rams.....	20%		
160 } Steam Syphon	40%		
160 } Portable Railway Syphons.....	15%		

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
PUMPS—Continued.		187 Entire Page..... 15%	
176	Edison Diaphragm:	The Perfect Sand Dryer:	
	Side Suction No. 2 Pump, only \$17.25	No. 1	\$ 75.00
	Side Suction No. 3 Pump, only 20.00	No. 2	45.00
	Side Suction No. 4 Pump, only 30.00	For Description and Price	
	Bottom Suction No. 2 Pump	List See Supplement.	
	Bottom Suction No. 3 Pump,	188 VILLAGE FIRE ENGINES:	
	Bottom Suction No. 4 Pump,	No. 4	\$185.00
	only 12.00	No. 5	250.00
	only 13.75	(Hose, etc, extra—See Catalog Index)	
	only 22.50	189 to	
	Hose and Strainers, same price as	Entire Pages Appl.	
	Channon Diaphragm Pumps.	193	
	Edison Outfits:	194 Entire Page 65%	
	No. 3	195 Entire Page 80%	
	No. 4	196 Large Well points, Fig. 400..... 40%	
	Galvanized Spiral Riveted Bille:	Irrigation Strainers, Fig 405..... 50%	
	2½-inch Diameter....per ft. .63½	EUREKA CYLINDERS, FIG. 450:	
	3 -inch Diameter....per ft. .75	2 x12-inch Stroke	2.25
	4 -inch Diameter....per ft. .87½	2½x12-inch Stroke	4.00
177	Fig. 275 Single Lever	3 x12-inch Stroke	5.50
	Fig. 276 Double Lever	Other Sizes	60%
	Fig. 350 Tiger	Seating Tools, Fig. 451.....	50-10%
178	Blackmer:	COUPLINGS:	
	Iron	197 Hexagon Rod:	
	Bronze	Black	12c
179	Entire Page Appl.	Galvanized	15c
	Rotary:	Pipe and Rod, No. 429.....	20%
180	Fig. 121	Reducer	30%
	No. 1	Hexagon Locknut.....	30%
	No. 2	Steel Substitutes	30%
	No. 3	Cast steel Shoes.....	30%
	No. 4	WOOD ROD COUPLINGS:	
	No. 5	Fig. 430	10c
	"Above iron pumps specially fitted	Fig. 432	13c
	for gasoline at extra charge of	Larger Sizes	20%
	\$1.50 each."	Forged Sucker Rod Couplings....	20%
	Fig. 198	Octagon Wood pump Rods.....	20%
	Rotary Gasoline Pump.	Suction Strainers	50-10%
	(See Supplement.)	198 Earth Augers	40%
181	Fig. 118:	Sand Pumps	5%
	No. 1, Iron	DRILLS:	
	No. 2, Iron	Fig. 615 and 616	30%
	No. 3, Iron	Fig. 610 and 611	15%
	Bronze	Drive Heads, Fig. 619.....	30%
	Fig. 375	Babcock Pipe Lifters	5.00
	Barrel Fig. 115:	199 Emerson Foot Valves and Strain-	ers 20%
	No. 1	Standard Foot Valves and Strainers:	
	No. 2	(Revised List—See Supplement.)	
182	Fig. 230	Screwed, Black	75-10%
	Fig. 231	Screwed, Galvanized	80-10%
	Boiler Test	Flanged, 15-inch and Smaller.....	75-10%
	Peerless Fig. 451.....	Flanged, 18 and 20-inch.....	40%
	Pitcher Spout:	Suction Hose Strainers:	
	Iron	Brass	40%
	Brass Lined	3-inch Malleable, black.....	1.45
183	Pump Jacks	3-inch Malleable, galvanized,	1.65
	Czar Tank Pump	PUMP GOVERNORS:	
	Outfit 1X.....	200 Fisher	30%
	Outfit 2X.....	Davis	35%
	Outfit 3X.....	Auto Governor and Condensation	
	Strainers	Receivers	
184	Triumph Water Lifts	METERS:	
	Perfection Cellar Drainers.....	201 Worthington:	
	Cistern Force:	General Service	25%
	Fig. 21, Brass Lined.....	Hot Water	15%
	Fig. 23, Brass Lined.....	Keystone	20%
185	Entire Page 40%	202 Galvanized Tanks f. o. b. fac-	
186	Bulldozer. (Revised List, See Sup-	tory (Waterloo, Ia.)..... 25%	
	plement.)		
	Allrite Pumping Head		
	30%		

Catalogue Page	Net Price or Discount	Page Catalogue	Discount or Net Price
AIR COMPRESSORS:			
203			
to	Entire Pages	Appl.	
207			
208	Jacobson	40%	
	No. 1 Air Pump	20%	
209	Compressors	Appl.	
ROCK DRILLS:			
210	Entire Page	Appl.	
211	Entire Page	Appl.	
212	Little Jap:		
	No. 2	\$ 45.00	
	No. 3	125.00	
	Drill Steels	30%	
	Dolly	3.00	
	Hose	ft. .25	
HAMMERS:			
213	Pneumatic:		
	Riveting, any size	55.00	
	Chipping, any size	45.00	
	Stone	Appl.	
	Holder-Ons	25.00	
	NOTE: Only one rivet set is now furnished with each hammer—state size wanted.		
214	AIR DRILLS:		
	Nos. 0 1 2 3 4		
	Each ...\$95.00 \$85.00 \$80.00 \$65.00 \$75.00		
	Nos. 00 21 22 11 12		
	Each ...\$95.00 \$85.00 \$80.00 \$85.00 \$85.00		
	No. 3 Wood Boring	\$ 65.00	
	No. 5 Wood Boring	75.00	
	No. 14 Wood Boring	80.00	
	No. 2 Boyer	75.00	
	No. 3 Boyer	75.00	
215	Sand Blast Apparatus	12½%	
	Stay-Bolt Clipper	Appl.	
SAND SIFTERS:			
	Tripod No. 1	55.00	
	Post No. 2	55.00	
SAND RAMMERS:			
	Chicago:		
	¾ in. x 4 in.	80.00	
	1 1-16 in. x 7 in.	85.00	
	1¼ in. x 7 in.	85.00	
	Keller:		
	1 in. x 5 in.	80.00	
	1½ in. x 7 in.	85.00	
	1¼ in. x 8 in.	95.00	
	3 in. x 10 in.	160.00	
216	COATES:		
	Flexible Shafts	10%	
	Clamp Spindles	5.00	
	No. 1 Multiplier	20.00	
	No. 2 Multiplier	20.00	
217	Breast Drills	5%	
	Electric Outfits:		
	Size A—110 Volts D. C.	70.00	
	Size A—220 Volts D. C.	72.00	
	Size A—550 Volts D. C.	75.00	
	Size B—110 Volts D. C.	91.50	
	Size B—220 Volts D. C.	92.50	
	Size B—500 Volts D. C.	100.00	
	Size A—60 Cycle, Single Phase, 110 or 220 Volts ..	95.00	
	Size A—60 Cycle, 2 or 3 Phase, 110 and 220 Volts ..	85.00	
	440 and 550 Volts	87.00	
ELECTRIC OUTFITS—Continued.			
	Size B—60 Cycle, Single Phase, 110 or 220 Volts ..	125.00	
	Size B—60 Cycle, Two or Three Phase, 110 and 220 Volts	110.00	
	440 and 550 Volts	112.00	
218	Buffing Outfits:		
	110 Volts, D. C.	\$ 45.00	
	220 Volts, D. C.	47.50	
	500 Volts, D. C.	55.00	
	110 or 220 Volts, Single Phase A. C.	75.00	
	Stove Polishing Outfits:		
	110 Volts, D. C.	86.50	
	220 Volts, D. C.	87.50	
	550 Volts, D. C.	95.00	
	110 and 220 Volts, 60 Cycle, Single Phase	120.00	
	Foundry Equipment	Appl.	
219	ELECTRIC GRINDERS:		
	110-220 Volts, D. C., Type A ..	40.00	
	110-220 Volts D. C., Type B ..	65.00	
	110-220 Volts D. C., Type D ..	88.00	
	110-220 Volts, 60 Cycle:		
	1, 2 or 3 Phase, Type A	48.00	
	1, 2 or 3 Phase, Type B	79.00	
	1, 2 or 3 Phase, Type D	114.00	
DRILLS:			
	Electric:		
	110-220 Volts, D. C., Type G ..	46.00	
	110-220 Volts, D. C., Type H ..	55.00	
	110-220 Volts, D. C., Type KS ..	66.00	
	110-220 Volts, 60 Cycle:		
	1, 2, or 3 Phase, Type H	59.00	
	1, 2 or 3 Phase, Type KS	69.00	
220	Duntley Electric:		
	Direct Current:		Each.
	Breast Drill, 110-220 Volts ..	\$ 50.00	
	1-M-1-10 Drill, 110-220 Volts ..	55.00	
	2 Speed Breast, 110-220 Volts ..	80.00	
	1-M-2-12 Drill, 110-220 Volts ..	93.00	
	1-M-3-19 Drill, 110-220 Volts ..	105.00	
	1-M-3-19 Drill, 550 Volts	145.00	
	2-A-M-2-21 Drill, 110-220 Volts ..	82.00	
	2-B-M-3-28 Drill, 110-220 Volts ..	88.00	
	2-B-M-4-44 Drill, 110-220 Volts ..	105.00	
	2-C-M-4-35 Drill, 110-220 Volts ..	125.00	
	2-D-M-4-48 Drill, 110-220 Volts ..		
	.....	Discontinued	
	.....	Each.	
	2-D-M-5-105 Drill, 110-220 Volts	\$165.00	
	3-M-4-36 Drill, 110-220 Volts ..	105.00	
	3-M-4-48 Drill, 110-220 Volts ..	105.00	
	Alternating Current:		
	Breast Drill, 110-220 Volts, ea.	55.00	
	Two-Speed Breast Drill, 110- 220 Volts	79.00	
	2-A-C-13 Drill:		
	110-220 Volts	120.00	
	440 Volts	125.00	
	2-A-C-20 Drill:		
	110-220 Volts	120.00	
	440 Volts	125.00	
	3-A-C-19 Drill:		
	110-220 Volts	135.00	
	440 Volts	140.00	
	3-A-C-24 Drill:		
	110-220 Volts	135.00	
	440 Volts	140.00	

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
DRILLS—Continued.		PIPE MACHINES—Cont'd.	
221 Barnes	Appl.	234 Armstrong	30%
222 Robertson	7½%	235 to } Green River:	
Champion:		236 } Fig. 15	10%
With Round Base	\$ 80.00	Fig. 45	10%
With Square Base	85.00	Fig. 55	10%
223 Silver	30%	No. 45. Green River Bolt Cut-	
224 Excelsior Friction	55.00	ter, Nut Tapper, etc. As-	
St. Louis Bench	17.50	sessment No. 2. Cut ¼ to	
225 Barnes' Lathes:		1½ inches. Change List to \$261.00	
No. 4½	63.75		
No. 5	85.90		
Horizontal Drilling Machines...	Appl.		
LATHES:		BLOWERS:	
226 Barnes:		237 Blowers and Exhausters.....	35%
9 in. x 24 in.	\$105.00	238 No. 0, 00 and 000	40%
9 in. x 36 in.	110.00	Electric:	
11 in. x 36 in.	135.00	No. 1—110-220 Volts D. C. or	
11 in. x 48 in.	142.00	A. C.	25.00
227 Engine: Entire Page.....	Appl.	No. 2—110-220 Volts D. C.	40.00
228 Extension Gap	Appl.	No. 2—110-220 Volts A. C.	45.00
KEYSEATERS:		No. 4—110-220 Volts D. C.	88.00
229 Burr:		No. 4—110-220 Volts A. C.	103.00
No. 1	40.00	239 Buffalo Electric	35%
No. 2	75.00	Champion:	
Giant: Special Prices	Appl.	Disc Wheels	60%
230 Burr Bore	33 1/3%	Blast Gates	30%
PIPE MACHINES:		240 Steel Plate	35%
231 Forbes	5%	Exhaust Fans	35%
232 Oster	25%	241 Cycloidal Exhausters	10%
Oster Power Pipe Machines:		242 U. S. Positive	15%
No. 200A Discontinued. No.		Connerville: (See New List in	
300A Substituted. Description		Supplement)	15%
and prices on applica-		Breast Drill, 110-220 Volts,	
tion.		Each	55.00
233 Williams:		CYCLONE DUST COLLECTORS:	
See New List Supplement....	15%	Old Style (Revised List; See	
Extras—From list on page 233.	50%	Supplement)	40%
Bolt Threading Attachment....	Net	Improved Style	25%
A Prices are for the latest Improved		PUNCHES:	
Speed Gear Machine (except No. 1		244 Combined Punches and Shears..	25%
Machine, which is driven by a 3-		245 Single	25%
step cone pulley) and includes R.		246 Entire Page	25%
H. dies, countershaft, extra cut-off		247 Entire Page	15%
knife, wrench, etc.		248 Entire Page	15%
No. 1 Machine can be operated		249 Entire Page	20%
either by hand or by power, and		250 Entire Page	20%
price does not include oil pump,		251 Entire Page	10%
which is \$15.00 extra.		252 Screw:	
B Prices are for motor driven Ma-		Cast Steel with Barhead.....	75%
chines, complete with direct con-		Forged Steel with Barhead...	40%
nected, constant speed, standard		Ratchet Head, extra—net....	\$ 9.00
type of motors, with starting		Extra Punches and Dies take	
switch and a reversing switch for		same discount.	
cutting L. H. threads.		Hydraulic Head	30%
C Prices are for Machines complete		Hydraulic Beam	10%
with direct connected steam engine.		HAMMERS:	
DIES—Nos. 1, 1½ and 2 Machines are		253 Justice	Appl.
furnished with 4 sets of R. H. Dies		Kerrihard:	
of 4 pieces to the set; No. 3 with 5		No. 1	\$ 85.00
sets of 6 pieces to the set; No. 4 with		No. 2	125.00
6 sets of 6 pieces to the set, and No.		254 Rochester	30%
5 with 8 sets of 8 pieces to the set.		Boss	110.00
The Dies furnished are as follows:		255 Saw Mills	25%
One set for ¼-in. and ½-in. pipe,		256 Saw Mills	25%
one set for ¾-in. and 1-in. pipe, one set		DOGS:	
for 1-in. and 1½-in. pipe, one set for 1½-		257 Ideal	35%
in. and 2-in. pipe, one set for 2½-in. and		Duplex	25%
3-in. pipe, one set for 3½-in. and 4-in.		258 Excelsior Machines	25%
pipe, one set for 4½-in. and 5-in. pipe,			
and one set each for 6-in., 7-in., 8-in.,			
9-in., 10-in. and 12-in. pipe.			
Eight sets of Bolt Dies are re-			
quired to thread bolts ¼-in. to 1½-			
in. In ordering Bolt Dies be sure to			
say whether V. or U. S. is wanted.			
Price for Gripping Chuck Jaws			
and Scroll Chuck Guides same per			
set as Pipe Dies.			

Page Catalogue	Discount or Net Price
SHARPENERS:	
259 Circular Saw:	
(F. O. B. Michigan Factory.)	
No. 40	90.00
No. 35	140.00
No. 95	200.00
Single Cut Automatic Band Saw:	
(F. O. B. Michigan Factory.)	
No. 115—8-inch Saws.....	120.00
No. 115—10-inch Saws.....	140.00
No. 100—12-inch Saws.....	175.00
No. 90—14-inch Saws.....	210.00
No. 90—16-inch Saws.....	220.00
No. 90—18-inch Saws.....	260.00
No. 99	300.00
260 No. 66 Resaw: (F. O. B. Michigan Factory.)	
Machine only	70.00
With Pulleys and Stands.....	80.00
No. 104 Resaw Stretchers:	
6-inch	65.00
8-inch	75.00
261 Knife Grinders (F. O. B. Michigan Factory)	Net
262 Knife Grinders (F. O. B. Michigan Factory)	10%
No. 46 Hand Sharpeners:	
(F. O. B. Michigan Factory.)	
Large	30.00
Small	25.00
BRAZING FORGES: (F. O. B. Michigan Factory.)	
14-inch	30.00
20-inch	40.00
263 Band Saws	20%
SAW TABLES:	
264 No. 5	55.00
No. 6	150.00
No. 6 with Countershaft.....	165.00
No. 7 Swing Saw	32.50
265 Planers	20%
266 Surfacers	20%
Grinders	20%
267 Jointers	20%
Shapers	20%
268 Wood Trimmers	15%
Dado Heads	5%
269 Mitering Machines	15%
Post Boring Machines.....	10%
PLOWS:	
270 Great Western, Right and Left:	
No. 106	Each \$19.50
No. 105	Each 22.00
No. 101	Each 26.00
No. 103	Each 35.00
Above prices include one Ex- tra Landslide Point.	
Extra Points for:	
No. 106, weight 19 lbs....	Each 4.25
No. 105, weight 21 lbs....	Each 4.25
No. 101, weight 33 lbs....	Each 5.15
No. 103, weight 43 lbs....	Each 5.75
Township and Road Plows:	
No. 5, Left Hand.....	Each 16.50
No. 15, Right Hand.....	Each 16.50
No. 3, Left Hand.....	Each 20.00
No. 13, Right Hand.....	Each 20.00
(Extra points not included in above price.)	
Extra Points or Shares for above	Each \$ 2.75

Page Catalogue	Discount or Net Price
PLOWS—Continued.	
271 Princess Road:	
No. 10A	\$ 21.00
No. 10D	15.00
Princess Rooter	30.00
No. 99 Giant	30.00
SCRAPERS:	
272 Columbus Drag, with runners:	
No. 1	Each \$ 4.90
No. 2	Each 4.55
No. 3	Each 4.25
Boss, with runners:	
No. 1	Each 4.55
No. 2	Each 4.25
Without runners deduct.....	.25
With bottom plates add.....	.50
Victor:	
No. 1	Each 4.50
No. 2	Each 4.25
273 Ox Shovels, with runners:	
Steel Bail, No. 0.....	Each 12.00
Steel Bail, No. 00.....	Each 16.00
Steel Bail, No. 000.....	Each 20.00
Buck:	
No. 3	Each 18.00
No. 2	Each 19.00
No. 1	Each 20.00
No. 1 Tongue.....	Each 7.00
No. 42 Flat Board	Each 5.50
No. 47 Levelers	Each 10.00
274 Wheeled:	
No. 1	Each 24.00
No. 2	Each 37.50
No. 2½	Each 40.00
No. 3	Each 42.50
Automatic End Gates for above:	
No. 1	Each 4.00
No. 2	Each 4.50
No. 2½	Each 5.00
No. 3	Each 6.25
Whiffletrees and Neck Yoke	Per set 4.00
CONTRACTORS' DUMP CARTS:	
275 Light	42.00
Heavy	45.00
Carts with Hoppers, 10 inches deep	Add 9.50
Carts with Automatic End Gates	Add 8.00
(F. O. B. Cars Ohio Factory.)	
ROLLERS:	
276 Hand	25%
Horse	25%
Road	Appl.
277 Traction Engines	Appl.
278 Dump Wagons	Appl.
REVOLVING CARS:	
1½-yd.	60.00
2-yd.	65.00
(F. O. B. Cars Knoxville, Tenn.)	
279 Locomotives	Appl.
280 Contractors' Dump Cars	Appl.
281 Industrial Railways	Appl.
Portable Track	50-10%
282 No. 211 Transfer Cars.....	Appl.
DRY KILN TRUCKS:	
Fig. 125	Appl.
Fig. 126	Appl.
Industrial Railway Switches	Appl.

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
283	ROCKER DUMP CARS:		COVER'S GOGGLES 1.25
	Less than Five Cars..... 20%		Respirators 1.25
	Five or More Cars..... 25%		WIRE ROPE:
	(f. o. b. Ohio Factory.)		(Revised List, See Supplement).
	Cars 421 to 425, Immediate Shipment.		(Lists on all wire rope—all kinds are new and in supplement.)
284	COAL WAGONS:	305	Entire Page 50-2½%
	No. 346 each 45.00	306	Bullock:
	No. 347 each 55.00		6x19 Construction 40-5%
	COAL CARS:		8x19 Construction 40-5%
	No. 17 each 77.00		6x37 Construction 40-5%
	No. 18 each 53.00	307	Reliance Elevator Cable..... 40-5%
	Side and Dump Cars..... 20%		Tiller Rope 50-2½%
285	No. 33 Cars each 50.00	308	Standard Plow Steel Rope..... 50-2½%
	No. 720 Cars each 40.00		Extra Strong Crucible..... 50-2½%
	Mining Cages Appl.		Extra Flexible Crucible..... 45-2½%
286	Mining Car Trucks Appl.		List on ¾" Standard Plow Steel Hoisting Rope should be 34c.
287	Mine Cars	309	Transmission or Haulage:
	(f. o. b. Cars—Ohio Factory)...		Crucible Steel 50-2½%
288	Mine Cars.		Extra Strong Crucible..... 50-2½%
	(f. o. b. Cars—Ohio Factory)...		Swedes Iron 50-2½%
289	Entire Page Appl.		Flexible Sash Cord:
290	No. 65 Push Car each 30.00		Galvanized Iron 40%
	VELOCIPEDES:		Annealed Iron 45%
	No. 1 each 31.00		Tinned Iron 45%
	No. 2 each 34.00		Copper 45%
	No. 3 each 40.00		Galvanized Mast-Arm 40%
	CARS:	310	Galvanized Iron 42½-2½%
	No. 1 Hand each 33.00		Galvanized Steel 42½-2½%
	No. 2 Bridge each 40.00		Galvanized Strand 60%
	No. 5 Inspection each 50.00	311	Galvanized Wire 42½-2½%
	Track Laying each 65.00	312	Switch Ropes, etc. 40%
291	Light Inspection:	313	Clips:
	(f. o. b. Cars—Indiana Factory.)		¾ to 1-inch incl. 60%
	With Single Seat..... each 50.00		Larger 50%
	With Double Seat..... each 70.00		Thimbles:
	Front Seat, Extra..... each 6.00		¾ to 1-inch incl. 60%
	No. 10 Motor Velocipedes..... 175.00		Larger 50%
	PLANET TURNABLES:		Sockets:
292	4 ft. diameter 33.00		¾ to ¾-inch incl. 50%
	5 ft. diameter 55.00		¾ to 1¾-inch incl. 40-5%
	6 ft. diameter 110.00		Larger 25%
	8 ft. diameter 190.00	314	Cabline 10%
	Prices above are for Flat Checked Top Tables. Can be furnished with grooved or raised rails at 5% advance. If rails are used be sure to spec- ify Gauge of Track wanted.		MANILA ROPE:
	Extra Frogs.	315	Entire Page Market
	4 ft. diameter...per pair extra 2.00	316	Drilling Cables Market
	5 ft. diameter...per pair extra 2.00	317	} AJAX ROPE Market
	6 ft. diameter...per pair extra 2.25	321	
	8 ft. diameter...per pair extra 2.50	322	Switch Ropes Appl.
	Hydraulic Presses Appl.		Magnolia Rope Dressing 10%
293	Car Wheels 30%		THIMBLES:
	Lumber Truck Wheels..... 50%	323	Open Cut 35%
294	Dynamite Appl.		Solid Round:
	Powder Appl.		Light Pattern up to 2 in. 40%
	Blasting Batteries 15%		Light Pattern, 2¼ to 3½ in. ... 35%
	Circuit Testers 15%		Heavy Pattern 30%
	Sundries Appl.		HOOKS:
	Blasting Mats Appl.		Swivel:
295	Crushers and Screens Appl.		½ to ¾ in. 15%
296	Crushers and Rolls Appl.		¾ to 1½ in. 25%
297	Crushers Appl.		Single 40%
298 to 302 inclusive	..... Appl.		Swivel 35%
303	VAJEN HEAD PROTECTORS:		BLOCKS:
	Style F each 100.00	325	Light Pattern, Wood Shell:
	Style G each 110.00		Combination, Iron Bushed.... 75%
	Style H each 120.00		Patent 6-Roller, Bushed..... 75%
			Self-Lubricating Br'nz' Bush'd 50%

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
BLOCKS—Continued:		PAINTERS' TRESTLES:	
326	Heavy Pattern, Wood Shell: Combination Iron Bushed.... 60% Self-Lubricating Bushed..... 50%	12 ft. and Shorter.....ft. .25	
327	Large Thick Mortise, Tackle: Com. Bushed 35% Self-Lubricating Bushed 35%	14 and 16 feet .....ft. .30	
328	Bullock 40%	18 feet .....ft. .35	
329	Wood Snatch: 35%	LADDERS:	
	Com. Iron Self-Lub. Bushed. Bronze B	Common Long 25%	
	Sizes 6 to 14-in. incl. 65% 50-10%	Rope Appl.	
	Size 16-in. 50-10% 50%	Extension 40%	
	Size 18-inch & larger 50% 45%	Sampson Step 40%	
	Snatch Blocks with bail 40% 40%	340 Sheaves for Manila and Wire Rope 50%	
	Samson Snatch 15%	341 Self-Lubricating Bushings 25%	
330	Chicago Steel:	342 Wire Rope Transmission Sheaves. 20%	
	Regular Pattern—Iron Bushed 50-10%	GATE SHEAVES:	
	Regular Pattern— Self-Lub. Bushed 45%	Common Bushed:	
	Heavy Pattern—Iron Bushed. 40%	4-inch each .65	
	Heavy Pattern 40%	6-inch each 1.25	
	Self-Lub. Bushed 40%	Self-Lubricating Bushed:	
	Galvanized—Regular Pattern:	4-inch each 1.25	
	Iron Bushed 45%	6-inch each 2.00	
	Self-Lub. Bushed 40%	Rubber Sheave Filling. See Page 693.	
	Steel Snatch:	Sheaves with Shafts and Boxes.... 20%	
	Com. Iron Self-Lub. Bushed Bronze B	HOISTS:	
	Sizes 6 to 14-in. incl. 60-10% 50-10%	344 Channon-Weston Chain, and Re- pairs 60%	
	Size 16-inch 50-10% 50%	345 Harrington Chain 20%	
	Size 18-in. & larger 50% 45%	346 Yale and Towne, Duplex..... 15%	
331	Heavy Steel 50%	347 Triplex 20%	
332	Wire Rope 50%	348 Harrington Hoists Repairs..... 15%	
333	Wire Rope 50%	349 Duplex Hoist Repairs 15%	
	With Detachable Hooks..... 50%	350 Triplex Hoist Repairs 20%	
	Without Hooks 60%	351 American Rope 50%	
334	Entire Page 50%	352 Pneumatic Geared 20%	
335	Wire Rope Snatch 50%	353 Champion Air 30%	
336	Cargo Hoisters 35%	354 Yale and Towne Electric (f. o. b. Cars—Stamford, Conn.) 20%	
	Gin:	355 Electric Triplex..... 20%	
	Ice 25%	356 Sprague Appl.	
	Light Pattern 35%	357 Flat Track Switch 35.00	
	Heavy Pattern 35%	Stirrups: See Supplement.	
337	Union Well Wheels 50%	Single 50-10%	
	Lumbermen's Loading..... 45%	Double 20%	
	Ferry Travellers 50-10%	Joists and Well Anchors..... Appl.	
	Channon Special Hoisting, Fig- ure 500 40%	Building and Construction Material Appl.	
	Wrought Iron Gin..... 40%	See Supplement, Page 23.	
338	Galvanized Tackle with Hooks.. 25%	TROLLEYS:	
	Galvanized, with Fast Eyes:	Flat Trolley Track 20%	
	No. 1 to 8 inclusive..... 40%	Hangers for Flat Track 20%	
	No. 9 to 16 inclusive..... 35%	Beef and Hog Travellers 25%	
	Galvanized, with Loose Hooks:	Fig. 9. Fig. 10. Fig. 12.	
	No. 1 to 8 inclusive..... 40%	Plain 20% 5% 5%	
	No. 9 to 12 inclusive..... 35%	Geared 5% Net	
	Awning 40%	359 I Beam Trolley Systems..... Appl.	
339	PAINTERS' FALLS, Complete: 45%	TROLLEYS:	
	Straps pair 1.00	Figure 98 35%	
	Stirrups pair 1.50	Figure 100 25%	
	Cornice Hooks pair 3.50	Figure 112 5%	
	Drop Cloths sq. ft. .02	Figure 113 5%	
	PAINTERS' STAGES:	Figure 117 25%	
	20 ft. and Shorter..... 60%	Figure 118 20%	
	Longer than 20 ft. Appl.	EXPANSION BARN DOOR HANGERS:	
	Cross Bars with Rollers, pair 1.15	No. 27 Hangers pair 1.85	
		No. 31 Trolley Track ft. .10	
		No. 31 Brackets each .10	
		No. 29 Hangers pair 2.50	

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
EXPANSION BARN DOOR HANGERS—Continued.		COUPLINGS—Continued.	
No. 232 Track	ft. .20	Shaw Compression:	
No. 232 Brackets	each .20	3½-inch and Smaller	65%
No. 123 Hangers	pair 3.00	Larger than 3½-inch	60%
No. 33 Track	ft. .25	SET COLLARS:	
No. 33 Brackets	each .25	Up to 4-inch	75-10%
Roller-Bearing Barn and Ware-		Over 4-inch	75%
House Hangers, No. 44:		384 Jaw Clutch Couplings	30%
No. 1	7.20	Universal Joint Couplings	Appl.
No. 2	10.30	385 Sole Plates	45%
No. 2½	16.25	Wall Brackets	50-10%
No. 3	22.50	Mule Pulley Stands	50%
STEEL BARN DOOR RAIL:		386 Take-Up Boxes	40%
No. 61	100 ft. 4.25	Belt Tighteners	40%
No. 68	100 ft. 5.50	Swinging Belt Tighteners	40%
Steel Barn Door Stay Roller, No. 54	40%	Adjustable Idlers	40%
SLIDING DOOR LATCH, No. 126:		387 Entire Page	Appl.
Price	each .75	388 GEARS, Spur, Entire Page	Appl.
Price	doz. 7.50	389 Beveled, Entire Page	Appl.
CRANES:		390 Mitre	Appl.
362-363 Entire Pages. Give full in-		Spur Racks and Pinions	Appl.
formation regarding Style, Max-		Worm Gearing	Appl.
imum Capacity and Dimensions	Appl.	LINK BELTING:	
364 Swinging Bracket Jib	20%	391 Detachable	60%
Pillar	Appl.	Attachments	50-10%
365 Champion Shop	40%	392 Attachments	50-10%
Hercules Shop	20%	393 Traction Wheels	40%
366 Manila Rope Transmission Sheaves	60%	Idlers and Tighteners	50%
368 Tension Carriages	50%	394 Chain Belt, Entire Page	35%
PULLEYS:		395 Sprocket Wheels	50-10%
369 Cast Iron (Revised List See		396 Coil Chain	Appl.
Supplement)	60%	Coil Chain Attachments	Appl.
370 Cast Iron (Revised List See		LOG JACKS:	
Supplement)	60%	No. 1	100.00
371 Davis Loose	50%	No. 2	155.00
Paper	Appl.	No. 3	235.00
(State number and sizes wanted.)		BUCKETS:	
372 Steel	50%	397 Tin Mill: (Revised List See	
373 Wood Split	60-10%	Supplement)	60-10%
374 Wood	60-10%	Steel Grain: (Revised List See	
375 Jones' Clutch:		Supplement)	50-10%
35-inch and under	50%	Steel Ear Corn: (Revised List	
36-inch and over	55%	Supplement)	45%
376 Master Friction Clutch	Appl.	Galvanized Steel: (Revised List	
377 Master Contracting Band Clutch.	Appl.	See Supplement)	45%
378 Jones' Friction Clutch Couplings.	60-5%	Sterling Warehouse	50%
379 Cold Rolled Steel Shafting	45%	398 Salem Elevator	65%
BURR KEYSEATER:		399 Malleable Iron	50-5%
No. 1	40.00	Heavy Steel	40%
No. 2	75.00	ELEVATOR BOOTS:	
Keyseating Shafting, cost of la-		400 Cast Iron	40%
bor	per hour .60	Steel	20%
HANGERS:		Fig. 88	Appl.
380 Drop	65%	Take-Ups, Fig. 96	50%
381 Head Shaft	65%	ELEVATORS:	
Post	65%	401 Complete	Appl.
Pillow Blocks	65%	402 Stone	Appl.
Flat Boxes	60%	Barrel	Appl.
382 Rigid Post Bearings	60%	CONVEYORS:	
PILLOW BLOCKS:		403 Standard Screw.	
Rigid	65%	(Discount from low list given)	65%
Ball and Socket	65%	Helicoid: (New List See Sup-	
Solid Bearings	60%	plement)	65%
COUPLINGS:		Extra Heavy Helicoid: New	
383 Solid Sleeve	55%	List See Supplement)	65%
Flange or Plate	55%	404 Conveyor Lining	Net
Ribbed Compression (Revised		Conveyor Hangers	Net
List See Supplement)	60-10%	405 Bearing Ends (low list)	45%
		Discharge Ends (low list)	45%
		Babbitted Bearing Ends (low list)	45%

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
CONVEYORS—Continued.		TAPS—Continued.	
406	Conveyor Parts, Entire Page.... 45%	Pipe Taps—"Regular:"	
407	Belt Appl.	Up to 2-inch 80-10-10%	
408	Clark Grain Shovels 40%	2½ and 3-inch 80%	
	Car Pullers 30%	3½ and 4-inch 60%	
	Car Puller Sheaves 25%		
SPOUTS:		Pipe Reamers:	
409	Loading 45%	Up to 2-inch 80-10-10%	
	Distributing 35%	2½ and 3-inch 80%	
	Bifurcated 30%	3½ and 4-inch 60%	
	Seeley Turn Heads 40%		
	Adjustable Bin Gates 25%	Pipe Hobs:	
	Bin Bottoms 40%	Up to 2-inch 40%	
410	Dump Scales 50-10%	2½ and 3-inch 15%	
	No. 225 Wagon Dump 30.00	3½ and 4-inch 10%	
	Ideal Car Loader 67.50	Combined Pipe Tap and Drill.. 35%	
SCALES:		Bit Brace 65-10%	
411	Entire Page 40%	419 Stay-Bolt, ¾ to 1½-inch, regu- lar proportion 60%	
412	Platform Counting: New List.	Special on application only.	
	600-lb. capacity 30.00	Spindle Stay-Bolt, ¾ to 1¼-inch 30%	
	1000-lb. capacity 35.00	Straight and Taper Boiler:	
	Portable Platform 50%	¾ to 1½-inch 65-10%	
	Portable Drop Lever 50%	1½ to 2 -inch 50-10%	
	Portable Platform with Double	Short Patch-Bolt, ½ to 1¼-inch. 65-10%	
	Beam 50%	420 Hob or Master, ¼ to 2-inch.... 40%	
413	Warehouse 50%	Short Hob, ¼ to 2-inch..... 40%	
	Wheelbarrow 40%	Seller's Hob, ¼ to 2-inch..... 40%	
	Mine or Tipple:	Taps for Beaman & Smith's	
	3-ton capacity 50-5%	Holders 40%	
	4-ton capacity and larger..... 50-10%	Blacksmith's Taper, ¼ to 1½-	
	Foundry 50%	inch 65-10%	
414	Railway:	421 Mud or Wash-Out 25%	
	2 and 3-ton capacity..... 50-5%		
	4-ton capacity and larger..... 50-10%	TAPPING MACHINES:	
	Steel Plant and Blast Furnace.. 50-5%	St. Louis Reversing 10%	
	Wagon and Hay, all styles.	Tapping Machine No. 1..each 4.50	
	4-ton 50-10%	Tapping Machine No. 2..each 9.00	
	Balance 60%		
TAPS:		SCREW PLATES:	
415	(Change list on ¾ in. Taps to \$3.60.)	422 Bay State 45%	
416	Machinists' Hand:	423 Bay State 45%	
	Up to 1½-inch..... 65-10%	424 Bull-Dog:	
	1½ to 2 -inch..... 50-10%	Machinists' Plates 45%	
	2½ to 3 -inch..... 33 1/3%	Automobile Plates 45%	
	3½ to 4 -inch..... 20%	Lightning: (Revised List See	
417	Machine or Nut: (Revised List, See Supplement).	Supplement) 35%	
	Up to 1½-inch..... 65-10%	425 Little Giant 35%	
	1½ to 2 -inch..... 50-10%	426 Green River 35%	
	2½ to 3 -inch..... 33 1/3%	(Plate No. 116 list should be.. 40.00)	
	3½ to 4 -inch..... 20%	(Plate No. 1112 incl. tap wrench.)	
	Tapper: (Revised List See Sup- plement.)	HART'S PATENT DUPLEX DIE STOCKS:	
	Up to 1½-inch 65-10%	Machinists' Sets 35%	
	1½ to 2 -inch 50-10%	Automobile Sets 35%	
	Pulley, ¼ to 1-inch 65-10%	427 } ADJUSTABLE ROUND SPLIT DIES:	
418	Machine Screw:	428 } Dozen lots of a size..... 45%	
	Dozen lots of a size..... 75-10%		
	Less Quantities 75%		
	Machine Screw Nut:		
	5 or less Net		
	Larger Quantities Appl.		
	Stove Bolt:	HOLDERS:	
	Dozen lots of a size 75-10%	Bit Brace 40%	
	Less Quantities 75%	Die 40%	
	Pipe Taps—"High Grade:"	429 TAP AND REAMER WRENCHES:	
	Up to 2-inch 80%	Bay State Adjustable 35%	
	2½ and 3-inch 70-10%	Standard 40%	
		Little Giant, Nos 20, 22 and 24 30%	
		Adjustable "T" 33 1/3%	
		Little Giant, Nos. 1, 2 and 3,	

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
TAP AND REAMER WRENCHES.—		STOCKS AND DIES—Cont'd.	
Continued.		Sets for Nos. 6 to 7XX..... 65-10%	
Little Giant, Nos 0, 5, 6, 7 and 8 30%		Extra Dies and Bushings.... 60-5%	
Lightning Adjustable 33½%		Extra Stocks 50%	
Chasers, Inside and Outside..... 35%		Nye "Easy Cutter" Pipe Dies.. 50%	
430	EXTRA PARTS FOR SCREW PLATES:	436	DRILLS:
Solid Screw Plate Stocks, Bay State 35%		Taper Shank, No. 102:	
Guides and Collets, Bay State.. 35%		1½-inch and smaller 65-10%	
Bull-Dog Screw Plate Parts.... 40%		Larger 40-5%	
Lightning Screw Plate Parts... 30%		Straight Shank, No. 104:	
Little Giant 30%		1½-inch and smaller 65-10%	
Full Mounted 30%		Larger 40-5%	
Green River, Extra Dies and Guides 30%		Straight Flute:	
Patent Elastic Stocks..... 30%		1½-inch and smaller 65-10%	
431	STOCKS AND DIES:	Larger 40-5%	
Machine or Solid Bolt Dies.... 50-10%		Left-Hand Drill, Special..... Appl.	
Round Adjustable Pipe Dies.... 40%		Single Twist:	
432	Channon Pipe Stocks and Dies:	Straight Shank, No. 108D:	
Sizes 0, 3 and 3½ 70-10%		¾-inch and smaller 40%	
Sizes 1, 1½, 1¾, 2 and 2 special 80%		Larger 20%	
Extra Parts for 0, 3 and 3½.. 70%		Taper Shank, No. 108E:	
Extra Parts for 1, 1½, 1¾ and 2 75%		¾-inch and smaller 40%	
Miller's Reversible Pipe Die Plates:		Larger 20%	
Style B 70%		437	Steel Wire No. 107..... 65-10%
Style C and D..... 66 2/3%		Straight Shank, Center, No. 108A 65-10%	
Enterprise Die Stock and Pipe Reamer 60%		Jobbers:	
Extra Dies:		No. 105 65-10%	
2 x 2 70%		No. 106 65-10%	
3 x 3 75%		438	Silver and Deming, No. 112..... 65-10%
4 x 4 75%		Prentiss, No. 111..... 65-10%	
433	Oster:	Coc's, No. 110, 1½-in and smaller 65-10%	
Bull-Dog Die Stocks..... 50%		Larger 40-5%	
Extra Dies 15%		Taper Square Shank, No. 109E. 45%	
Patent Adjustable Die Stocks, Nos. 0 to 5 50%		439	Three and Four Groove: (Revised List. See Supplement.)
Extra Dies 15%		1½-inch and smaller..... 50%	
Patent Ratchet Die Stocks:		Larger 30%	
Nos. 7, 7½ and 8..... 50%		Universal Self-Oiling Appl.	
Extra Dies 15%		Two-Grooved Shank:	
Geared Die Stocks Nos. 16 and 17:		No. 104D, 1½-inch and smaller 65-10%	
Complete 50%		Larger 40%	
(Revised List, See Supplement)		No. 105D 65-10%	
Extra Dies 15%		Extra Long Straight Shank Twist 25%	
434	Hart's:	440	Straight Shank Machine Bits, No. 108 45%
Adjustable Duplex Die Stocks. 50%		Prentice Machine Bits, No. 108C 45%	
Extra Dies 10%		Wood Chucking, No. 113..... 55%	
Hart's Buckeye Die Stocks. (See Supplement.)		Bit Stock, No. 109..... 70-10%	
Toledo Tool No. 25..... 50%		Wood Boring Brace, No. 109B. 57½%	
(See Supplement.)		Extra Length, No. 109C..... 50%	
Toledo Pipe Threading Device.. 50%		441	Twist Drill Sets..... 65-10%
Extra Dies 25%		Extra Wooden Blocks.... each .50	
"No. 1½ R has 11½ thread on all sizes for pipe line work."		Metal Stand Sets 65-10%	
435	Special Pipe Cutting and Threading Outfits 50%	Extra Metal Stands each \$1.00	
Armstrong's Stocks and Dies:		Jewelers' Sets 65-10%	
Set for Pipe No. 1 to No. 3XX 70-10%		Extra Case Net	
Extra Dies and Bushings.. 65%		Drill and Countersink Combined, Do. 114 33½%	
Extra Stocks 50%		Drill and Countersinks Combined, with No. 1 Taper Shank, No. 114A 30%	
No. 4 Set Discontinued.		Flat Ratchet 30%	
		442	Hercules High Speed Twist, low list prices.
		Style A 33½%	
		Style C 35%	

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
DRILLS—Continued.		REAMERS—Continued.	
443	Diamond High Speed Twist:	454	Standard Taper Pin, No. 120D. 40%
	Taper Shanks, No. 402.....40-10%		"Taper Pin Reamers in Set in
	Straight Shanks, No. 404.....40-10%		Wooden Box Containing 0, 1,
444	Jobbers' Length, No. 405.....40-10%		2, 3, 4, 5 and 6, \$8.50 set less.. 40%
	(Revised List. See Supplement.)		Bit Stock Taper, No. 120B..... 50%
	Straight Shanks, No. 406.....40-10%		Bit Stock Taper Reamer Sets.. 50%
	Wire Gauged Sizes, No. 407..40-10%		Lightning Countersinks..... 30%
445	Three and Four-Groove:		Center..... 25%
	With Taper Shanks.....30-10%		Stubbs' Broaches..... 30%
	With Straight Shanks.....30-10%		Lightning Burring..... 40%
	With Two-Groove Shanks,		Burring Tools..... 40%
	No. 404D.....30-10%	455	Diamond High Speed:
	No. 405D.....40-10%		Jobbers, No. 250, Straight
446	Bonding Drills, No. 508.....40-10%		Shank..... 33 $\frac{1}{3}$ %
	Twist Track Bits, No. 506.....40-10%		No. 251 Taper Shank..... 33 $\frac{1}{3}$ %
	Twist Track Bits or Drills,		Shell, No. 260 Fluted..... 33 $\frac{1}{3}$ %
	No. 507.....30-10%		No. 261 Rose..... 33 $\frac{1}{3}$ %
	Flat Track Bits, No. 505..... 10%		Chucking, with Taper Shanks,
	Tenant Patent, No. 504..... 10%		No. 262..... 33 $\frac{1}{3}$ %
	Self-Oiling Drills..... Appl.		With Taper Shanks, No. 264 33 $\frac{1}{3}$ %
447	Norka:		With Straight Shanks, No.
	Chucks, Nos. 10, 20, 30 and		263..... 33 $\frac{1}{3}$ %
40	..... 40%		With Straight Shanks, No
	Fitting Norka Chucks, Nos. 10		265..... 33 $\frac{1}{3}$ %
	20, 30 and 40..... 40%	457	Three-Groove Chucking, No. 266 33 $\frac{1}{3}$ %
448	Chucks, Nos. 0, 1, 2, 3 and 4.. 40%		Bridge Builders' Straight
	Fitting Norka Chucks, Nos. 0,		Shank, No. 268A..... 33 $\frac{1}{3}$ %
	1, 2, 3 and 4..... 40%		Taper Shank, No. 268..... 33 $\frac{1}{3}$ %
449	Sockets..... 70%	458	McCrosky Adjustable:
	Sleeves..... 70%		New Style, Hand and Machine 15%
	Center Keys or Drifts..... 40%		Old Style, Hand and Machine 15%
	"Use 'Em Up" Sockets..... 25%		Shell..... 15%
	Armstrong's Drifts..... 25%		Arbors for McCrosky Shell... 15%
450	REAMERS:		"For High Speed Reamers add
	Hand, No. 115..... 40%		20% to list instead of 10% as
	Hand, No. 122..... 40%		shown in Catalogue List."
	Common Sense Expansion, No.	459	MILLING CUTTERS:
	129 (Revised List in Sup'm't) 40%		Carbon Steel..... 33 $\frac{1}{3}$ %
	Three-Groove Chucking, No.		High Speed Steel..... 20%
	120K..... 25%	460	END MILLS:
	Taper Shank Jobbers, No. 116.. 40%		Carbon Steel..... 33 $\frac{1}{3}$ %
451	Shell..... 33 $\frac{1}{3}$ %		High Speed Steel..... 20%
	ARBORS:		Spiral:
	Diamond Easy Starting:		Carbon Steel..... 33 $\frac{1}{3}$ %
	No. 125, with Straight Shank. 33 $\frac{1}{3}$ %		High Speed Steel..... 20%
	No. 125A, with Taper Shank. 33 $\frac{1}{3}$ %		"T" SLOT CUTTERS:
	For Shell Reamers:		Carbon Steel..... 33 $\frac{1}{3}$ %
	No. 120J, with Straight Shank 33 $\frac{1}{3}$ %		High Speed Steel..... 20%
	No. 120T, with Taper Shank.. 33 $\frac{1}{3}$ %		END MILLS, with Center Cut:
452	REAMERS:		Carbon Steel..... 33 $\frac{1}{3}$ %
	Fluted Chucking:		High Speed Steel..... 20%
	Straight Shank, No. 120F.... 33 $\frac{1}{3}$ %		SHELL END MILLS:
	Taper Shank, No. 120E..... 33 $\frac{1}{3}$ %		(Revised List, See Supplement.)
	Rose Chucking: (Revised List,		Carbon Steel..... 33 $\frac{1}{3}$ %
	See Supplement.)		High Speed Steel..... 20%
	120H, Straight Shanks..... 33 $\frac{1}{3}$ %	461	CUTTERS:
	120G, Taper Shanks..... 33 $\frac{1}{3}$ %		Side Milling:
453	Taper:		(Revised List, See Supplement.)
	No. 118..... 40%		Carbon Steel..... 33 $\frac{1}{3}$ %
	No. 118A..... 40%		High Speed Steel..... 20%
	Air Drill, No. 120L.....70-10%		With Inserted Teeth:
453	Air Drill Reamers with square		(Revised List, See Supplement.)
	Taper Shank Fitting Ratchets		Carbon Steel..... 33 $\frac{1}{3}$ %
	(See Supplement).....70-10%		High Speed Steel.....Net List
	Standard Taper or Rod, No. 120A 40%		Angular:
	Taper or Rod, No. 124..... 40%		(Revised List, See Supplement.)
	Standard Taper, No. 120C.....70-10%		Carbon Steel..... 33 $\frac{1}{3}$ %
			High Speed Steel..... 20%

Page Catalogue	Discount or Net Price
CUTTERS—Continued:	
Double Angle:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
For Grooving Taps:	
Carbon Steel	33 1/3%
High Speed Steel	20%
For Fluting Reamers:	
Carbon Steel	33 1/3%
High Speed Steel	20%
462 For Grooving Taps and Reamers:	
Carbon Steel	33 1/3%
High Speed Steel	20%
Sprocket Wheel:	
Carbon Steel	33 1/3%
High Speed Steel	20%
For Roller Chains:	
Carbon Steel	33 1/3%
High Speed Steel	20%
For Block Center Chains:	
Carbon Steel	33 1/3%
High Speed Steel	20%
Convex and Concave:	
Carbon Steel	33 1/3%
High Speed Steel	20%
For Making Twist Drills:	
Carbon Steel	33 1/3%
High Speed Steel	20%
463 Patent, for Gear Wheel Teeth:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
Improved Stocking, for Involute Gears:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
Face Milling:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	Net List
464 Patent Involute:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
Mitre and Bevel Gear:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
Corner Rounding:	
Carbon Steel	33 1/3%
High Speed Steel	20%
Patent Involute, for use on No. 6 Automatic Gear-Cutting Machines:	
(Revised List, See Supplement.)	
Carbon Steel	33 1/3%
High Speed Steel	20%
465 SAWS:	
Metal Slitting Saws:	
(Revised List, See Supplement.)	
Metal Slitting	33 1/3%
Lots of 100 of one size only, 33 1/3-10%	
Metal Slitting High Speed Steel	20%
Circular, for Metal	
	33 1/3%
CUTTERS:	
Screw Slotting	
	33 1/3%
Screw Slotting, lots of 100 of	
one size only	
	33 1/3-25%

Page Catalogue	Discount or Net Price
CUTTERS—Continued.	
Screw Slotting Cutter Arbors,	
List	
	each \$3.50
Discount	
	15%
466 S. & G. Inserted Tooth High	
Speed Milling Cutters	
	40%
467 Practical Books	20%
468 BROWN & SHARPE TOOLS:	
Entire Page (Revised List see	
Supplement)	
	25%
469 Entire Page (Revised List see	
Supplement)	
	25%
470 Depth Gauges	25%
Standard Steel Rules	
	30%
471 Narrow Steel Rules, No. 130....	30%
Narrow Tempered Steel Rules..	
	30%
Tempered Steel Rules	
	30%
With Patent End Graduations	
With Beveled Edges	
	30%
Tempered Steel Shrink Rules..	
	30%
(Revised List, See Supplement.)	
6-inch Rule with Slide, No. 364	
	25%
Slide Caliper Rules	
	25%
472 Steel Caliper Rules	25%
Tempered Hook Rules	
	30%
Narrow Tempered Hook Rules..	
	30%
Flexible Steel Rules	
	30%
Triangular Metallic Scales....	
	25%
Caliper Squares	
	25%
473 Keyseat Rules	25%
Steel Rules with Holders.....	
	30%
Hardened Steel Straight Edges.	
	25%
Standard Steel Straight Edges..	
	25%
Beveled Straight Edges	
	25%
Automatic Center Punches:	
No. 616 Pocket	
	25%
No. 617 Adjustable	
	25%
474 Dial Test Indicators.....	15%
B. & S. Indicators.....	
	25%
B. & S. Scribes	
	25%
Lathe Test Indicators	
	25%
Improved Universal Bevel Pro-	
tractor	
	25%
Improved Universal Bevel	
	25%
Universal Bevels	
	25%
475 Entire Page	25%
476 Entire Page	25%
477 Entire Page	25%
List on Screw Pitch Gauge,	
No. 21	
	1.25
List on Thickness Gauge, No. 782	
	1.00
478 B. & S. Protractors.....	30%
B. & S. Combination Sets.....	
	30%
Combination Sets	
	30%
Combination Squares	
	30%
Draughtmen's Protractors	
	25%
479 Entire Page	25%
480 Vernier Calipers	15%
Universal Surface Gauges, Heavy	
Base	
	25%
Universal Surface Gauges.....	
	25%
Spacing Attachments	
	25%
Toolmakers' Clamps	
	25%
481 Entire Page	30%
482 Firm Joint Calipers, three styles	
shown	
	30%
Steel Beam Trammels	
	25%
Calipers and Dividers, No. 1160.	
	30%
Universal Dividers	
	25%

Page Catalogue		Discount or Net Price
STARRETT'S TOOLS:		
483	Entire Page	30%
484	Slide Caliper Rules	25%
	Patent Keyseat Rules	25%
	Folding Steel Pocket Rules.....	30%
	No. 299 Rule Clamps	25%
	Keyseat Clamps, No. 298.....	30%
	Starrett's Blacksmith's Rules... (Revised List, See Supplement.)	30%
	Hook and Handle Rules, No. 465	30%
	Patent Combination Square,	
	No. 11	30%
	No. 23	40%
485	No. 33 Combination Square	30%
	Bevel Protractors, No. 12.....	30%
	Combination Square Attachment	25%
	Combination Set, No. 9.....	30%
	No. 10 Inclinator	25%
	Double Steel Square, No. 14.....	25%
	Patent Double Squares, No. 13..	25%
	Reliable Try Squares, No. 60...	25%
486	Entire Page	25%
487	Entire Page	25%
488	No. 226 New Micrometers.....	25%
	No. 128 Micrometers	15%
	No. 124 Inside Micrometers....	25%
	Micrometer Caliper Gauges, No. 126	25%
	Adjustable Caliper Gauge No. 125	25%
489	Entire Page, See Supplement...	25%
490	Entire Page, Revised List See Supplement	25%
491	Entire Page	25%
492	No. 199 Cut Nipper	15%
	No. 1 Adj Jaw-Cut Nipper.....	15%
	Remainder of Page	25%
493	Entire Page	30-5%
494	Entire Page	30-5%
495	Universal Dividers, No. 89.....	30-5%
	Universal Dividers, No. 89,	
	Extra Parts	30-5%
	Patent Dividers, No. 92.....	30-5%
	New Trammels, No. 59.....	25%
	Improved Bronze Divider, No. 90	30-5%
	Extension Beam Trammels,	
	No. 51	25%
	Extension Steel Beam Trammels,	
	No. 58	25%
	Improved Extension Divider,	
	No. 85	30-5%
496	Improved Trammel Points, No. 50	25%
	No. 88 Ball Points.....	30%
	Center Gauges	25%
	Center Gauge Attachments....	25%
	Steel Straight Edges, No. 380...	25%
	Steel Straight Edges, No. 385...	25%
	Spacing Center Punches, No. 118	25%
	No. 185 Drill Tap and Steel Wire Gauge	25%
497	No. 130 Iron Level	30%
	No. 132 Iron Bench Level.....	30%
	Improved Levels for Testing Shafting, etc., Nos. 97 and 98.	25%
	Engineers' and Plumbers' Levels, No. 133	25%
	Nickel Plated Pocket Levels..	30%

Page Catalogue		Discount or Net Price
STARRETT'S TOOLS—Continued:		
	No. 135	30%
	Cross Test Levels, No. 136....	25%
	Tap Wrenches, No. 91.....	25%
	Universal Scrapers, No. 194....	25%
498	SLOCOMB MICROMETERS:	
	Nos. 25, 26 and 31.....	15%
	Extra Cases	10%
	Sets No. 19 and 20.....	15%
	Extra Cases, No. 19.....	Net
	Set No. 21	10%
	Extra Cases	Net
	No. 101 Wing Calipers.....	60%
	(Revised List, See Supplement.)	
	No. 35 Wing Dividers.....	70%
	(Revised List, See Supplement.)	
	SS Vernier Calipers	25%
	(Revised List, See Supplement.)	
499	Tool Holders	25%
	Register Calipers, No. 3.....	33 1/3%
	Improved Depth Gauge, No. 57.	25%
	Rotameter	Net
	Lightning Speed Indicator.....	25%
500	B. & S. Speed Indicator.....	25%
	Redington Counting Machine...	5.00
	American Counting Machine....	8.50
	Veeder Speed Counter	2.75
	Ideal Revolution Counter	Net
	Job Counter	15%
	Benton Tally Register.....	20%
501	Champion Expanding Mandrels.	25%
	Hardened and Ground Steel	
	Mandrels	30%
	Tweezers	25%
	Magnets	25%
	Nail Pullers	50%
BOX HOOKS:		
	Round Shank	20%
	Octagon Shank	20%
502	OIL FINISHED COLD CHISELS:	
	Hand, American Crucible Tool Steel:	
	Sizes 1/4, 1/2, 3/4.....	60%
	Larger sizes	80%
	Hand, Jessop Steel:	
	Sizes 1/4, 1/2	30%
	Size 3/4	40%
	Larger sizes	60%
	Cape, American Crucible Tool Steel:	
	Jessop Steel	70%
	Diamond Point, American Crucible Tool Steel	50%
	Jessop Steel	65%
	Jessop Steel	50%
	Round Nose, American Crucible Tool Steel	65%
	Jessop Steel	50%
	Long Brick, American Crucible Tool Steel	20c
	Knurled Cup Point Nail Set....	60%
	Knurled Center Punch	60%
	Solid Drive Punches.....	20c
	Machinists' Bell Centering	
	Punches	40%
	Curved Bearing Scrapers.....	50%
	Sharpen Ezy (See List in Supplement)	40%

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
503	BITS:	509	BRACES:
	Reamer (Revised List See Supplement) 33 1/3%		Barber's Improved:
	Countersink 33 1/3%		Each Dozen
	Screw Driver (Revised List See Supplement) 30%	No. 33.....\$1.35 Net \$14.85 Net	
	Cotter Pin Extractors.....each \$.15	No. 32..... 1.50 Net 16.20 Net	
	PLUMB BOBS:	No. 31..... 1.60 Net 17.55 Net	
	Iron (Revised List See Supplement) 20%	No. 30..... 1.70 Net 18.90 Net	
	Brass 25%	No. 13..... 1.00 Net 10.80 Net	
	STEEL SQUARES: (Revised List See Supplement.) Each Doz.	No. 12..... 1.15 Net 12.15 Net	
	No. 1 .....\$0.95 \$ 9.50	No. 11..... 1.25 Net 13.50 Net	
	No. 3 ..... .80 8.25	No. 10..... 1.35 Net 14.85 Net	
	No. 3B 1.30 13.25	No. 123..... .70 Net 7.65 Net	
	No. 14 ..... .70 7.00	No. 122..... .75 Net 8.10 Net	
	No. 12 ..... .60 6.30	No. 121..... .80 Net 8.55 Net	
	STANLEY Sliding "T" Bevels,	No. 23..... .40 Net 4.00 Net	
	No. 25 40%	No. 22..... .45 Net 4.50 Net	
	Try Squares, No. 20..... 30%	No. 21..... .50 Net 5.00 Net	
504	BAILEY Iron Spoke Shaves..... 30%	Spofford:	
	Adjustable Plane, all styles.... 30%	Each Dozen	
	STANLEY:	No. 108.....\$0.85 \$ 9.60 Net	
	Marking Gauges, both styles.... 40%	No. 110..... .95 10.80 Net	
	Plumbs and Levels 33 1/3%	No. 112..... 1.25 12.00 Net	
505	SOCKET FIRMER CHISELS	P. S. & W. Samson:	
	(Revised List, See Supplement). 75%	No. New No. Each Dozen	
	Sets in Plain Boxes 75%	3200 8014.....\$2.15 \$23.60 Net	
	Sets in Fancy Boxes..... 70%	3201 8012..... 2.00 22.20 Net	
	SOCKET FRAMING CHISELS.	3202 8010..... 1.85 20.80 Net	
	(Revised List, See Supplement). 60%	3203 8008..... 1.75 19.40 Net	
	Tanged Turning 25%	3204 8006..... 1.75 19.40 Net	
	GOUGES: (Revised List See Supplement.)	P. S. & W. Ratchet Braces:	
	Tanged Turning 25%	No. New No. Each Dozen	
	Socket Firmer 30%	3004 7006.....\$1.50 \$16.60 Net	
	Carpenter's Slicks (Revised List See Supplement) 30%	3003 7008..... 1.50 16.60 Net	
	DRAW KNIVES: (Revised List See Supplement) 50%	3002 7010..... 1.60 18.00 Net	
	Perfect Handle (Revised List See Supplement) 45%	3001 7012..... 1.75 19.40 Net	
	BITS:	3000 7014..... 1.90 20.80 Net	
506	Bit Brace Auger:	Combination Corner Braces .....each \$3.25	
	Snell Pattern .....70-10%	DRILLS:	
	Jennings' Pattern 50%	510 Yankee Breast:	
	Irwin Pattern 50%	No. 550 .....each 4.00	
	Auger, in Sets:	No. 555 .....each 4.75	
	Irwin Pattern .....each \$3.50	No. 101 Reciprocating 50%	
	Jennings' Pattern .....each 3.25	Automatic Chain:	
	Clark's Expansive.....50-10%	No. 307 .....each 2.00	
	Extra Cutters 40-5%	No. 0307 .....each 1.50	
	Nut Augers 75%	No. 316 .....each 2.75	
507	Ship Augers 50%	No. 0316 .....each 2.25	
	Ship Auger Car Bits 50%	No. 0308 .....each 1.25	
	Ship Auger Bits 50%	Yankee Automatic:	
	AUGER HANDLES: Each Doz.	No. 41 .....each 1.25	
	No. 660 8c .75	No. 44 .....each 1.35	
	No. 1 ..... .50c 5.00	No. 108 Automatic .....each 1.25	
	No. 2 ..... .50c 5.00	511 Millers Falls, Hand..... 25%	
508	BITS:	Goodell Pratt, Hand..... 40%	
	Car, Snell Pattern.....50-10%	Breast:	
	Irwin Pattern 50%	Nos. 10, 12, 13 and 19..... 25%	
	Machine 60%	No. 6 .....each 3.00	
	Boring Machine Augers 75%	Giant, Nos. 58, 59 and 60..... 40%	
	BORING MACHINES:	Bench:	
	Miller's Falls 6.00	Nos. 20 and 22 25%	
	No. 1 3.25	Nos. 8, 8 1/2, 9 and 9 1/2 25%	
	No. 2 3.50	Angular and Ratchet Drilling Machines 45%	
		RATCHETS:	
		514 Armstrong Standard Reversible	
		Ratchet Drill, Entire Page.... 25%	
		515 Packer 65%	
		Keystone Reversible 25%	

Page Catalogue		Discount or Net Price	Page Catalogue		Discount or Net Price
RATCHETS—Continued.					
516	Armstrong's Short	25%	524	VISES:	
	Renshaw	45%		Standard Hand, No. 549.....	25%
	Armstrong Universal	25%		Alford No. 1.....	25%
	Extra Spindles	25%		Spring Hand (Revised List, see Supplement)	30%
517	Monarch	25%		The Boss, No. 540.....	25%
	Keystone Weston	30%		Improved Hand	33½%
	Giant Railroad	30%		Jewelers' Pin	33½%
	Keystone New Drill Sleeves.....	20%		Peerless Pipe Grips	25%
	Square Shank Drill Sleeves.....	20%	525	Bullock Bench and Machinists':	
DRILLING POSTS:					
	Fig. 100	40%		No. 90 Series	50%
	Fig. 200	25%		No. 80 Series (Revised List see Supplement)	35%
AUTO KITS:					
518	Perfection	30%		No. 70 Series	50%
519	Reliance	30%		No. 50 Series	35%
	Rival	30%	526	Improved Prentiss' Patent.....	25%
	Challenge	30%		Parker's Patent	25%
PLIERS AND NIPPERS:					
520	Flat Nose, No. 06½.....	25%	527	Heavy Filing or Chipping.....	25%
	Round Nose, No. 07½.....	25%		Woodworkers':	
	Long Flat Nose, No. 10.....	25%		No. 151.....	50%
	Long Round Nose, No. 11.....	25%		No. 152.....	50%
	Weavers', No. 22	25%		No. 153.....	35%
	Chain No. 13	25%		No. 154.....	35%
	Combination	75%		No. 155.....	50%
	Improved Combination, No. 80..	25%		No. 156.....	50%
	Burner	70%		No. 157.....	35%
	Gas	70%		No. 158.....	35%
	Button's	75%		Bullock Oval Slide	60%
	Each Doz.			Quick Acting Woodworkers'....	35%
	12-inch Button Pliers, List..\$3.00	\$30.00	528	Automatic Swivel:	
521	Side Cutting:			Solid Jaws	50%
	Vom Cleff (German extra quality, No. 64)	25%		Swivel Jaws	50%
	P. S. & W., No. 30.....	45%		Universal Automatic Swivel....	50%
	Diagonal Cutting, No. 53.....	25%		New Shepard	25%
	Linemens'	60%		Diamond	40%
	End Cutting, No. 850½.....	25%	529	Combination Pipe:	
	Carew's Patent Wire Cutters.....	20%		Prentiss' Monarch	65%
	(Revised List see Supplement.)			Parker's Patent	60%
	Long Nose Electricians' Side Cutting, No. 72	25%		Smith's	70%
522	Bernard's Patent: (Revised List see Supplement.)			Chain Pipe:	
	No. 100 Flat Nose	25%		Vulcan (Revised List see Sup- plement)	25%
	No. 101 Round Nose	25%		Ellis	20%
	No. 102 Cutting Pliers	25%	530	Malleable Hinged Pipe: (Re- vised List see Supplement.)	
	No. 113 Vise	25%		No. 0	1.25
	No. 125 End Cutting	25%		No. 1	1.50
	No. 135 Music Wire	25%		No. 2	2.25
	Starrett's No. 199 Cut Nipper....	15%		No. 3	3.00
	Adjustable Jaw Cut	15%		No. 4	7.00
	"Victor," Nickel Plated Combina- tion Pliers. Each Doz.			Armstrong's Plain and Hinged..	75%
	6-inch	\$0.60		Angle Plate Extra	50%
	(See Supplement.)			Extra Jaws	50%
	De Vilbiss Pliers (See Supp.)..	45%		Prentiss Twentieth Century Pipe	50-10%
523	CLIPPERS:			Blacksmith's Solid Box:	
	New Easy Bolt and Rivet.....	50-10%		100 lbs. and under.....	65%
	Extra Jaws for New Easy Bolt Clippers	40%		101 to 140 lbs.....	60%
	Carolus Nut Splitter and Bolt (Revised List see Supplement), No. 1N	4.00		111 lbs. and over	50-10%
	No. 2N	4.50	SCREW DRIVERS:		
	Brown's Snip Shears.....	30%	531	Perfect Handle	50%
TINNER'S SNIPS:					
	Straight Blade	50%		Champion	50-10%
	Curved Blade	50%		Helmer	50%
				Van Kleeck	70%
				Yankee	35%
				No. 31 Yankee Spiral Ratchet Screw Driver, Heavy Pattern. Used right and left hand and rigid. Same style as No. 30.	
				Price	1.75
				No. 130. The same as No. 30	

Page Catalogue	Discount or Net Price
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SCREW DRIVERS—Continued.

with an additional spring, which causes the handle to come back for the next push, in driving screws in or out.

It is a "quick return" and more rapid as well as convenient, than pulling the handle back.

The extreme length of tool with bit in chuck is $17\frac{1}{2}$ inches when closed, and $26\frac{1}{4}$ inches when extended

Chucks with Drill Points for
Yankee Screw Drivers..... 35%

(Revised List See Supplement Page 21.)

532 **HAMMERS:**

Machinists':

Ball Pein 70%

Perfect Handle Ball Pein,

.....\$0.60 each; doz., \$ 6.00

Straight and Cross Pein.....60-10%

Nail 50%

Special (1 lb. only).....per doz. 3.40

Blacksmiths' Hand60-10%

Engineers'60-10%

Riveting 50%

Chipping60-10%

Bricklayers'50-10%

MALLETS:

533 Hickory Net

Lignum Vitae Net

Tinners' Net

Rubber, See Page 692.

Copper Hammers with Handles, lb. .35

Hide Faced Hammers 25%

Raw Hide Mallets 25%

Raw Hide Mauls (Revised List, see Supplement) Net

Sewer Builders' Mauls 60%

HATCHETS:

534 Usona Brand 60%

Hunters' Hatchets or Axes—

doz. lots50-10%

Less Quantities 50%

Germantown Half..... 25%

ADZES:

Usona R. R., 4, $4\frac{1}{2}$ and 5-inch.

.....each \$.80 doz. \$ 8.00

Shipeach 1.50 doz. 15.00

AXES: (Not Handled)

535 Boughton:

Single Bitted: Each. Doz.

$3\frac{1}{2}$ to $4\frac{1}{2}$ lbs.....\$0.50 \$ 5.35

4 to 5 lbs......55 5.75

5 to 6 lbs......65 6.50

Double Bitted:

4 to 5 lbs......85 8.50

Usona:

Single Bitted, 4 to 5 lbs. .45 4.50

HANDLED AXES:

Boughton:

Single Bitted, 4 to 5 lbs. .80 8.25

Single Bitted, 5 to 6 lbs. .90 9.00

Double Bitted, 4 to 5 lbs. 1.10 11.00

Usona:

Single Bitted, 4 to 5 lbs. .60 6.00

Firemen's 1.20 12.00

WRENCHES:

536 W. & B.:

Machinists' Knife Handle.....50-10%

Machinists' Steel Handle..... 60%

Page Catalogue	Discount or Net Price
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WRENCHES—Continued.

Railroad Special50-10%

Agricultural or Regular..... 75%

Improved Acme Steel Wrenches

(See Supplement) 60%

537 Coes50-5%

W. & B. Combination.....50-10%

(Revised List See Supplement.)

Patent Long Nut Combination... 60%

WESCOTT ADJUSTABLE "S"

WRENCH (See Supplement).. 40%

538 Lowell Reversible Ratchet..... 20%

Extra Gears 20%

Lowell Lag Screw 10%

Bridge Builders' 5%

Steel Socket Bridge 5%

Little Giant Reversible Ratchet. 25%

Giant Reversible Ratchet..... 25%

Extra Sockets 25%

539 Champion Ratchet.....per set \$ 3.50

Socket:

for Square Head Bolts..... 25%

for Hexagon Cap Screws and

Nuts 25%

Standard Brace—

for Hexagon Nuts..... 25%

for Square Nuts 25%

540 W. & B. Auto33 $\frac{1}{4}$ %

Channon's Adjustable Auto..... 50%

Billing's Adjustable Auto..... 25%

Cotter Pin Puller and Adjustable 25%

Billing's Bicycle 30%

Pocket A. B. C..... 40%

(Revised List See Supplement.)

Pocket D. E..... 40%

(Revised List See Supplement.)

Hexagon Box50-10%

(Revised List See Supplement.)

Drop Forged Steel:

Entire Page50-10%

Entire Page50-10%

(Revised List See Supplement.)

Entire Page50-10%

Entire Page50-10%

Construction and Car Builders' 50-10%

Construction50-10%

Additional Sizes of Construction

Wrenches with Offset and Straight

Openings Listed in Supplement.

Tracklb. 8c

Fitting Uplb. 10c

Alligator or Bull Dog..... 75%

Always Ready 60%

546 Stillson Adjustable Pipe:

6 in. to 48 in. Broken Boxes.. 70%

6 in. to 48 in. Full Boxes.....70-10%

Extra Parts, 6 in. to 48 in.... 65%

Trimo Adjustable Pipe:

6 in. to 48 in. Broken Boxes.. 70%

6 in. to 48 in. Full Boxes.....70-10%

Extra Parts, 6 in. to 48 in.... 65%

Cochran Pipe Wrench (For Description, See Supplement).... 70%

Parmelee Girdle Pipe 40%

Extra Parts 40%

Westcott's Adjustable Pipe.... 40%

Brown's Adjustable Pipe Tongs 5%

Common Pipe Tongs..... 40%

547 Chain Pipe:

Victor 50-5%

Vulcan 45%

Page Catalogue	Discount or Net Price	
WRENCHES—Continued.		
		Vulcan "Bijaw." See Supplement) 45%
		Ideal 40%
548		PIPE CUTTERS:
		Trimo 70%
		Extra Parts 60%
		Barnes 80%
		Extra Parts 70%
		Saunders 75%
		Extra Parts 70%
		Armstrong 60-10%
		Extra Parts 50%
549		Ellis 20%
		Extra Parts Net
		Eck Net
		Extra Cutters Net
		Stanwood 50-5%
		Extra Parts 25%
CHUCKS:		
550		Entire Page 35%
		(Revised List, See Supplement.)
		Horton Lathe (See Supplement) 35%
551		Cushman Four-Jaw Independent Lathe 35%
		Westcott's Scroll Combination Lathe 40%
552		Cushman:
		Geared Scroll 25%
		Round Body and Box Body... 25%
553		Skinner:
		Planer 20%
		Reversible Face Plate Jaws... 35%
		Cushman Reversible Face Plate Jaws 35%
Horton:		
		Reversible Face Plate Jaws... 35%
		(See Supplement.)
		Skinner Drill Press Vise..... 30%
		Armstrong Drill Press Vise... 25%
554		Skinner Geared Pattern Drill:
		Single Lots 25%
		Dozen Lots 30%
		Skinner New Model Drill:
		Single Lots 25%
		Dozen Lots 30%
		Horton Drill: (Revised List, See Supplement.)
		Nos. 0, 1, 2 and 3 50%
		Nos. 4, 5, 6 45%
		Gronkvist Drill Chucks (Revised List, See Supplement) 25%
		Jacob's Drill (Revised List, See Supplement) 35%
		Almond Patent Drill 35%
555		Little Giant:
		Improved Double Grip 40%
		Auxiliary Screw Drill 40%
		Graham Drill 30%
National:		
		Round Body Drill 45%
		Drill 45%
		Wizard Quick Change Drill... 15%
		(See Supplement for description and price on Chuck.)
		Collets (Revised List, See Supp.) 15%
		Drill Chuck Arbors:
		Straight Shank 20%
		Taper Shank 25%

Page Catalogue	Discount or Net Price	
CHUCKS—Continued.		
556		Lathe or Hollow Mill (See Supplement) 35%
		Standard Drill 45%
		Goodell Drill 45%
		Star Drill 25%
Turret Head Tools:		
		Almond Discontinued
		Baker Improved Almond..... 30%
557		Morrow Hand Operated Drill... 25%
		Davis' Milling Attachments.... 15%
ARMSTRONG'S TOOLS:		
558		Entire Page 25%
559		Entire Page 25%
		(Revised List, See Supplement.)
560		Entire Page 25%
561		Lathe Tool Sets and Cabinets.. 25%
		Special Self-Hardening Steel... 20%
		Slotter Tools 25%
		Extra Cutters 25%
		New Planer Jacks 25%
562		Champion, Entire Page..... 30%
563		Boring and Planer Tools, Entire Page 30%
564		Champion Combination Tool Holders.. 30%
		Tait's Universal Tool Holders.... 15%
565		LATHE TOOLS:
		Carbon Steel 30%
		High Speed Steel 10%
O. K. TOOL HOLDERS AND TOOLS:		
566		Entire Page Net
567		Entire Page Net
568		Knurls or Milling Wheels... each 50c
KNURLING TOOLS:		
		Armstrong 25%
		Billing's Improved 20%
		Extra Knurls each 50c
		Adjustable Knurl Handle... each 50c
569		LATHE DOGS:
		Drop-Forged, with Bent Tails... 35%
Steel:		
		Heavy Pattern 75%
		Light Pattern 70%
		Armstrong Clamp 25%
		Steel Dog Wrenches..... each 15c
		Die Dogs 30%
570		Drop-Forged Double Screw Lathe Dogs (Revised List, See Supplement) 35%
CLAMPS:		
		Drop Forged "C" 35%
		(Revised List, See Supplement.)
		Carriage 50-10%
		Extra Heavy Machinists' 66 2-3%
		Snow's Pattern, Adjustable..... 60%
		Colt's Eccentric 40-5%
		Clamp Dogs 30%
		Cleveland Brick Clamp (Revised List, See Supplement)..... Net
571		Heavy Ship Carpenters' 30%
		Ship Clamp Screws 40%
		Boat Clamp Screws 40%
		Carpenters' and Cabinetmakers' Peerless, Adjustable 10%
		(Revised List See Supplement.)
		Cabinetmakers' Wood 10%
		Glue Net

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price	
572	SCREWS:		STEEL LETTERS, FIGURES AND STAMPS—Continued.	
	Wood Hand		Electric Branding and Soldering Tools:	
	Wood Bench		Doz. Lots	10%
	Iron Bench		Less Quantities	Net
	BENCHES:			
	Cabinetmakers'			
	Manual Training			
573	TOOL CHESTS AND CASES:	583	PATTERN LETTERS:	
	Electricians' New Hand Tool, No. 1003		White Metal:	
	Carpenters' New Hand, No. 35..		\$20.00 List and over	60%
	Machinists' No. 1		Less Quantities	50%
	Nos. 2 and 3 and 75		Brass, any Quantity	30%
	Carpenters' Empty, Nos. 260, 260½, 270		Perfect Leather Fillet	45%
			PATTERN MAKERS' SHRINK-AGE RULES: (Revised List see Supplement)	40%
574	TAPES:	584	FOUNDRY RIDDLES: Each. Doz.	
	Reliable Measuring		Galvanized	\$0.50 \$5.00
	Reliable Junior Measuring		Brass .....	.80 8.00
	Challenge Steel		Brass Dowel Pins	25%
	Challenge Junior Steel		Stencils	Appl.
575	Metallic Measuring		Brass Checks	Appl.
	Ass Skin Measuring		Medical Cabinets	40%
	Starrett Pocket	585	BELLS AND GONGS:	
	Lufkin Pocket		Trip Gong:	
	Sterling Linen		Polished Bell Metal	50%
576	Drawing Instruments		Steel	50%
577	Levels and Transits		Locomotive Gong	45%
	RULES:		Binnacle and Fog Signal	60%
578	Boxwood		Roof or Hood	40%
	Caliper	586	Farm	cwt. \$ 3.00
	Folding Pocket Ziz Zag		School and Church	50%
579	Hickory Board		Fire Alarm	50%
	Hickory Log	587	BRUSHES AND DUSTERS:	
	Spring Steel Board		Wire Casting	60%
	Lumber Gauges		Moulders' Bristle	20%
	CASTERS:		Extra Glue	65%
	Martin Anti-Friction		Bristle Marking	60%
	Payson's Anti-Friction	588	Whitewash	60%
	Stationary (See Supplement)		Star Calcimine	60%
580	Cement Workers' Tools Entire		O. K. Calcimine	65%
	Page		Scrub	20%
581	CRAYONS:		Roofing	65%
	Boughton Lumber:		Knotted Roofing	65%
	Gross Lots		Counter:	
	Less Quantities		No. 2	doz. 3.50
	Dixon Lumber:		No. 3	doz. 7.00
	Gross Lots	589	Floor	20%
	Less Quantities		Flat Wall Paint	65%
	Metal Workers':		Round Wall Paint	60%
	Flat		Painters' Dusters	60%
	Square		Kongo Chisel Flat Varnish	60%
	Round		Chisel Oval Varnish	65%
	Railroad Chalk:		Black Stencil	65%
	White		French Sash Tools	60%
	Blue or Red	590	Channon's Marine Paints and Varnishes	Appl.
	White Round Chalk or School	591	SAND, GARNET AND EMERY PAPER AND CLOTH:	
	.....gross		Flint Sand Paper:	
	Carpenters' Chalk		Full Reams	60%
	Lump Chalk		Quires	50%
			Rolls	60%
582	STEEL LETTERS, FIGURES AND STAMPS:		Garnet Paper in Sheets or Rolls	25%
	Boughton:		Emery Paper: (Revised List see Supplement.)	
	½ in. and smaller		Full Reams	60%
	Larger		Quires	50%
	Broken Set or Extra Letters and Figures		Roll (Revised List see Supplement)	60%
	Steel Stamps			
	Log Marking			
	Adjustable Burning Brands			

Page Catalogue	Discount or Net Price
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SAND, GARNET AND EMERY PAPER AND CLOTH—Continued.

Emery Cloth:	
Full Reams	60%
Quires	50%
Rolls	60%
Flint Sand Cloth	50-10%
Garnet Cloth	25%

EMERY IN BULK: (Revised List see Supplement.)

Best Turkish:

Nos. 4 to 46 Keg Lots...cwt	4.25
Broken Lots .....	.07½
Nos. 54 to 200 Keg Lots...cwt	4.50
Broken Lots .....	.07¾
Flour, Keg Lots	4.00
Broken Lots .....	.07

Packed as Follows:

Full Kegs about 350 lbs.	
Quarter Kegs about 100 lbs.	

592 } FILES AND RASPS: to 599 }

Imperial:

Full Boxes	75%
Broken Lots	70-10%

Nicholson's Great Western:

Full Boxes	80-5%
Broken Lots	75-10%

Swiss Pattern:

Doz. Lots Assorted, or of one size	50%
Less Quantities	40%

597 FILE HANDLES:

Soft Wood:

No. 1 4 in. long ½ in. Ferrule	Gro.	\$ 1.00
No. 2 4½ in. long ¾ in. Ferrule		1.25
No. 3 4½ in. long ¾ in. Ferrule		1.50
No. 4 4½ in. long ¾ in. Ferrule		1.60
No. 5 5 in. long 1½ in. Ferrule		2.25
Nos. 1, 2 and 3 assorted		1.25
Nos. 1, 2, 3 and 4 assorted		1.35
Nos. 1, 2, 3, 4 and 5 assorted		1.50

Hard Wood with Brass Ferrules:

No. 1 4 in. long ½ in. Ferrule	1.50
No. 2 4½ in. long ¾ in. Ferrule	1.75
No. 3 4½ in. long ¾ in. Ferrule	2.50
No. 4 4½ in. long ¾ in. Ferrule	3.00
No. 5 5 in. long 1½ in. Ferrule	3.50
Nos. 1, 2 and 3 assorted	1.90
Nos. 1, 2, 3 and 4 assorted	2.25
Nos. 1, 2, 3, 4 and 5 assorted	2.50
Spun Ferrule	50%

Jewelers':

	Doz. Lots.	Gross	Lots.
Nos. 1 and 2	\$0.35		\$ 3.50
Nos. 3 and 4 .....	.45		4.50

Stub Files and Holders

FILE CARDS AND BRUSHES:

Nicholson's Mounted on Leather	50%
Nicholson's File Card and Brush, Mounted on Leather	50%
Colton's Steel Back	25%
Common Pattern	33¼%
Bent rifflers	50%
Surface File Holders	50%

598 HACK SAW BLADES:

Sterling Hack Saw Blades (See Supplement.)

Discount, Doz. Lots	40%
Discount, Gross Lots	40-10%

Page Catalogue	Discount or Net Price
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HACK SAW BLADES—Continued.

Peerless:

Doz. Lots	40%
Gross Lots	50%
Starrett's Back	50%
Star	25%

Universal:

Hand, Doz. Lots	35%
For Power Machines, Gross Lots	40%

599 HACK SAW FRAMES:

No. 10 Extension	20%
(Revised List, See Supplement.)	
No. 6 Star	25%
Star No. 10	25%
Extra Heavy Adjustable	20%
Cast Iron	20%
(Revised List, See Supplement.)	
No. 20 Steel	20%
Rail	35%
Magazine	25%
Solid Grip Hack Saw Frames (See Supplement)	Net

SAWS:

600 Marvel Draw Cut Hack: (See Supplement.)

No. 1	15.00
Nos. 2 and 5	10%
Star Power Hack	20%
Power Hack, No. 30	25%

601 Q. & C. Shop: (f. o. b. Factory.)

No. 1	16.75
No. 3	22.50
No. 4	45.00
No. 8 Circular Shop (f. o. b. Factory)	45.00
No. 1 Bench Hack	50%

602 BRYANT RAIL SAWS:

No. 5	100.00
No. 5A	125.00
No. 6	125.00
No. 6A	150.00

F. O. B. Plainfield, N. J.

CYLINDER BORING BARS:

Size Bar.	Size Cyl.	
2½ in.x5 ft.	4 in. to 10 in.	280.00
3½ in.x5 ft.	7 in. to 18 in.	290.00
4 in.x5 ft.	8 in. to 24 in.	295.00
4 in.x8 ft.	8 in. to 24 in.	325.00
5 in.x6 ft.	9 in. to 40 in.	380.00
5 in.x8 ft.	9 in. to 40 in.	395.00
6 in.x6 ft.	10 in. to 50 in.	450.00
6 in.x8 ft.	10 in. to 50 in.	475.00

Price of Additional Adjustable Centers for above Boring Bars

603 SAWS:

Channon's Hand, Panel and Rip: Sterling Brand (Revised List, see Supplement)

	25%
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Helmer Brand (Revised List, see Supplement)

	25%
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Atkins' Hand Panel and Rip:

No. 400	25%
No. 53, Silver Steel	25%

604 Bishop's Hand, Panel and Rip:

Back	35%
Compass	35%
Interchangeable Compass	35%

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
SAWS—Continued.		GRINDERS—Continued.	
Nests of Nos. 1 and 2.....	25%	612 Hand: (Revised List See Supplement.)	
Swage Jumper or Upset.....	25%	Princess, Bull Dog Nos. 1 and 2	20%
CIRCULAR SAW MANDRELS:		Giant (Revised List, See Supplement)	20%
Nos. 1, 2 and 3.....	50%	Cook's Magic.....	25%
No. 4 and 5.....	50-10%	Hummer Diamond Tool.....	20%
Nos. 6, 7, 8, 9 and 10.....	60%	Union Grinder No. 3.....	20%
605 Circular Saws, Entire Page....	50%	(See Supplement for Description.)	
(Revised List see Supplement.)		Bench Grinders.....	50-10%
606 BAND SAWS:		Grinding Machine Columns.....	50-10%
Narrow.....	60%	Countershafts.....	50%
Wide.....	55%	614 Bench Tool.....	20%
Gasoline Saw Brazing Outfit, each	9.00	New Yankee Drill.....	Appl.
Silver Solder.....ounce	.85	Wet Tool:	
MORRILL'S SAW SETS:		16x1½ Wheel.....	67.00
Special.....each	.90	24x2 Wheel.....	91.00
No. 3.....each	1.25	No. 012 Velox Emery.....	7.25
No. 4.....each	1.35	615 Norton Grinding Machines:	
No. 10.....each	.90	Bench.....	25%
Cross Cut Saws (Revised List, See Supplement).		Floor.....	25%
Great American, Tuttle and Ten-		Pedestal.....	25%
on Tooth.....	35%	Bench and Floor Grinder	
Hollow Back Tuttle Tooth..ft.	16c	Counter Shafts.....	25%
One-Man Cedar King.....	40%	616 GRINDSTONES:	
One-Man Tuttle Tooth.....	40%	Loose:	
SAW HANDLES:		Under 40 lbs.....	\$22.00
No. 2 Climax.....each	15c	40 to 200 lbs.....	21.00
No. 12 Climax.....each	20c	Over 200 lbs.....	25.00
Each. Doz.		Keystone Iron Frame.....	20%
No. 1 Loop.....\$0.28	\$ 2.85	(Revised List See Supplement.)	
No. 8 Loop......17	1.75	Wooden Frame.....	20%
One-Man.....	25%	(Revised List See Supplement.)	
Supplementary.....	25%	617 Athol Iron Grindstone Frames.	10%
608 OIL STONES:		Samson Mounted:	
Genuine Arkansas and Washita		No. 1.....each	3.10
Lily, White Mounted.....	35%	No. 2.....each	2.90
Round Edge Slips, both Brands.	25%	No. 3.....each	2.70
Pen Knife Pieces, both Brands	25%	618 Bi-Treadle Mounted:	
Arkansas Files.....	35%	Regular.....each	\$ 2.70
India Oil Stones, all as shown		Ballbearing.....each	3.00
on page.....	25%	Auto Double Treadle Mounted.	
India Oil Stones, extra wood		No. 1.....each	3.50
boxes.....each	25c	No. 2.....each	3.35
Extra Iron Boxes.....each	35c	No. 3.....each	3.10
609 NORTON GRINDING WHEELS:		Hercules Mounted (Revised List	
\$3.00 List and over.....	75%	see Supplement)	20%
Under \$3.00 List.....	65%	619 WHEELS:	
610 EMERY WHEEL DRESSERS:		Cloth.....	Appl.
Colmer:		Patented Paper Polishing.....	Appl.
Single Lots.....each	.10	Paper Friction Pulleys.....	Appl.
Dozen Lots.....doz.	1.00	620 Canvas Polishing, Entire Page..	Appl.
100 Lots.....each	.06	CHAIN:	
500 Lots.....each	.03	Machine:	
1000 Lots.....each	.04½	6-0 to 2-0.....	60%
Huntington, complete with ex-		1-0.....	50-10%
tra set Cutters.....each	50c	1 and 2.....	50%
Cutter Wheels only.....set	.08	3.....	25%
Dozen Sets.....	.75	Less than 100 feet.....add	10%
100 Sets.....	5.00	Cable.....	25%
Norton.....	25%	Less than 100 feet.....add	10%
Wheels only.....	Net	Sash Chain, Steel.....	65%
Wrigley.....	35%	Less than 100 feet.....add	10%
Genuine Diamond.....	Appl.	Plumbers'.....	65%
Diamo-Carbo.....	25%	Bright Coil:	
Combination Diamo-Carbo.....	25%	German Pattern:	
611 GRINDERS:		2-0 to 2-0.....	75%
Entire Page Revised List See			
Supplement.....	15%		

Page Catalogue	Discount or Net Price
CHAIN—Continued.	
1-0	70-10%
1 and 2	70%
3	65%
4 to 6	55%
Less than 100 feet.....add	10%
Triumph	45%
Less than 100 feet.....add	10%
For sizes 1-0, 2-0 and 3-0, see Union Locked Link Chain in Supplement.	
Brown	45%
Less than 100 feet.....add	10%
American	40%
Jack-Chain:	
Iron	50-10%
Brass	50-10%
Entire Page	Market
Entire Page	Market
Links:	
Drop Forged Connecting.....	50%
Keystone Quick Repair.....	50%
Lap	Appl.
Ring Dogs	Appl.
CHAIN AND ANCHOR SHACKLES:	
½-inch and smaller	50%
Larger sizes	40%
Chain Rafting Dogs	Appl.
STEEL CHAIN HOOKS:	
Round and Grab:	
¼-inch and ⅜-inch.....	60%
⅜-inch and ½-inch.....	50%
½-inch to ¾-inch.....	45%
Bunk	50%
TURNBUCKLES:	
Bridge:	
With Stubs:	
Up to 1¾-inch incl.....	50-5%
1½-inch	50%
1¾-inch to 1¾-inch.....	45%
2-inch	40-5%
2½-inch to 3-inch.....	35%
Without Stubs:	
2-inch and smaller	65-10%
2½-inch to 3-inch	50-10%
Galvanized Sleeve	40%
Galvanized Wrought Pipe.....	40%
Wrought Iron: (Revised List see Supplement.)	
1-inch and smaller	60%
Larger to 1½ inches.....	50%
Larger to 2 inches.....	45%
COTTERS:	
Spring	90-50%
Cellar Box	90-50%
KEYS:	
Riveted	Appl.
Flat Spring	90-50%
Nubbed End Spring.....	50%
Assorted Spring Cotteners	90-50%
Gib Head Square Machine Keys.....	50-10%
Standard Steel Taper Pins.....	70-10%
PADLOCKS:	
Each. Doz.	
Cast Bronze Pin Tumbler, No. 04186	\$1.50 \$15.00
Cast Bronze No. 04204.....	.75 7.50
All Brass, No. 04199.....	.50 5.00
Brass Plated Steel:	
No. 4132¼ .....	.45 4.50

Page Catalogue	Discount or Net Price
PADLOCKS—Continued.	
No. 4132¼C .....	.60 6.00
Cast Bronze No. 04104.....	.75 7.50
Brass and Steel, Secure Lever:	
No. 4010 .....	.30 3.00
No. 04010 .....	.55 5.50
No. 4010C .....	.40 4.00
Brass and Steel, with Chains:	
No. 4047 .....	.20 2.00
No. 4047C .....	.30 3.00
Brass, No. 4049 .....	.25 2.50
HINGES: (Revised List see Sup- plement.)	
Light Strap	60%
Heavy Strap	70%
Light "T"	50%
Heavy "T"	40%
Extra Heavy "T"	60%
Hinge Hasps	35%
Wrought Steel Staples	85%
Wrought Hooks and Staples.....	85%
Screw Hooks and Straps.....	40%
Wrought Hasps and Staples.....	85%
Bright Wire Screw Eyes.....	90%
Bright Wire Screw Hooks.....	90%
(Revised List, See Supplement.)	
SCREWS:	
Square and Hexagon Cap:	
Full Boxes	70-10%
Broken Lots	70%
Round Head Cap	
Made to order only.	Appl.
Fillister Head Cap:	
Full Boxes	60-5%
Broken Lots	60%
Flat Head Cap:	
Full Boxes	50-5%
Broken Lots	50%
Iron Set:	
Full Boxes	75-10%
Broken Lots	75%
Hollow Set:	
Less than 100	Net
Larger Quantities	25%
Allen's Patent Safety Set Screws: Net	
(Revised List, See Supplement.)	
Iron Machine:	
(Revised List, See Supplement.)	
Round and Flat Head.....	75%
Fillister Head	65%
Brass Machine:	
(Revised List, See Supplement.)	
Round and Flat Head.....	70%
Fillister	65%
Coupling Bolts	
Milled Iron Studs	70%
Boiler Patch Bolts	30-10%
PLANER HEAD BOLTS.	
Nuts	60%
Washers	45%
MALLEABLE IRON THUMB SCREWS:	
Threaded	25%
Blank	50%
Nuts:	
Threaded	25%
Blank:	
¼-inch and larger.....lb.	15c
Smaller	25c

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
DROP FORGED THUMB SCREWS:		SWIVELS:	
Blank	40%	Galvanized Wrought Iron.....	20%
Threaded	40%	Galvanized Malleable Iron.....	10%
Thumb Nuts:		Brass	Net
Blank	40%	HOOKS:	
Threaded	40%	Wrought Iron Barrel	Net
635 IRON WOOD SCREWS:		Hogshead	10%
Flat Head, Bright	87½-5%	Bale	Net
For Flat Head Blued add to net	5%	Box	Net
Round and Oval, Blued	85-5%	Can	15%
Round and Flat Head, Nickel Plated	77½-5%	Wrought Iron Chain.....	25%
Brass Wood Screws:		Keystone Safety Shackle.....	25%
Flat Head	80-5%	646 Railroad and Boat Spikes.....	Market
Round and Oval	77½-5%	(Revised List, See Supplement.)	
Round and Oval, Nickel Plated.....	72½-5%	Track Bolts	Market
Bronze Wood Screws:		Drop Forged Machine Handles...	40%
Flat Head	75-5%	BALLS:	
Round and Oval Head.....	72½-5%	Hardened Steel	10%
BOLTS:		Brass, Bronze or Bell Metal...	25%
636 Flat and Round Head Stove....	85%	RIVETS:	
Elevator:		647 Copper and Burrs	40%
Countersunk Head Style.....	65%	Copper Burrs only	20%
Other Styles	60%	Assorted Copper	40%
637 Machine	Market	Bifurcated or Clinch (see Supp.)	10%
638 Common Carriage	Market	Tubular	25%
Plow	Market	Assorted Tubular, in Cartons...	25%
Tire	Market	648 Rivets in Bulk	75%
639 Coach and Lag Screws.....	Market	Swedes Iron Burrs	70-10%
Expansion, with Shield and Lag Screw	50-10%	(Revised List see Supplement.)	
(Revised List, See Supplement.)		Tinners' Rivets	75%
Expansion Shields only	50-10%	Rivet Sets	60%
(Revised List, See Supplement.)		The "Best Yet" Riveting Ma- chine No. 10	10%
640 One-part, Four-way Expansion Composition Screw Anchor....	50-10%	(Revised List, See Supplement.)	
(Revised List, See Supplement.)		649 NAILS:	
Standard Expansion Bolt	50-10%	Wire	Market
(Revised List, See Supplement.)		Coated	Market
Double Expansion, Shields only.	60%	650 Entire Page	Market
Single Expansion, Shields only..	60%	651 Gold Medal Drill Rod (Revised List see Supplement).....	70%
Toggle, Both Styles	25%	652 Bessemer Steel Rod.....	lb. 5c base
NUTS:		Hard Brass Rod	Market
641 Finished Case Hardened Hex- agon	70%	Roll and Sheet Brass	Market
Semi-Finished Hexagon	80%	Platers' Metal	Market
Machine Screw, Iron	50%	653 Soft or Mild Steel	Market
Brass	50%	Norway or Swedish Iron.....	Market
642 Hot Pressed, Square.....	Market	654 Common Iron	Market
Hexagon	Market	654 TOOL STEEL:	Basis per lb.
Cold Punched Chamfered and Trimmed Square and Hex- agon	Market	Columbia Extra	15c
643 WASHERS:		Columbia Special	18½c
Wrought Iron: (Revised List see Supplement)	Market	Columbia High Speed	70c
WASHERS, Lock:		Crescent, Sanderson and Howe- Brown, Extra	15c
Less than 1000	20%	Regular Grade of any of the above	8c
Larger Quantities	Appl.	Rex High Speed	70c
644 EYE BOLTS:		Jessop	18½c
½-inch and Smaller	50-10%	Mushet	75c
Larger	50%	Novo	85c
RING BOLTS:		Note: We furnish extra grade unless otherwise specified.	
½-inch and smaller	50%	SPRING STEEL:	
Larger	40-10%	Basis per lb.	
645 SCREW HOOKS:		Open Hearth	4½c
½-inch and smaller	50-10%	Crucible	8c
Larger	50%	Note: We furnish open hearth unless crucible is specified.	

Page Catalogue	Discount or Net Price
655	WIRE:
	Gold Medal Music:
	No. 13 to 40 .....lb. 35%
	Smaller sizes .....Appl.
	Soft, on Spools .....50%
	Spring, on Spools .....50%
656	In Coils .....Market
	Cloth .....Market
657	Cloth, in Rolls .....Market
	Screens:
658	Eclipse Steel Wire .....25%
	Standard Coal .....35%
	Handy .....40%
659	Car and Yard .....25%
	Sand40%

WAGON CHUTES:**"Angle Extension:"**

Black, 8 ft. and longer.....ft.	50c
Galvanized, 8 ft. and longer.....ft.	60c
Black, 6 ft. and shorter.....ft.	55c
Galvanized, 6 ft. and shorter.....ft.	65c
"Telescope"	50%

660	Fuses .....Appl.
	Torpedoes .....Appl.
	Gumbo CementNet

METAL POLISH:

Easy Bright discontinued, other brands on application.

BELTING: (See Revised List in Supplement.)

662	Rubber:
	Bullock .....60%
	Full Rolls .....60-5%
	Castor .....65%
	President .....50%
664	Reinforced Conveyor .....Appl.
	Concentrator .....Appl.
665	Leather:
	Champion .....65%
	Harrison .....70%
	Extra Standard .....70-10-5%
	Rawhide Leather .....Appl.
	Anhydrous .....55%
666	Special Creamery .....60-10%
	Special Dynamo .....70-5%
	"Dickbelt" Balata Gutta Percha,
	Dick's Original.....50-10%
	Full rolls .....60%
	(Revised List, See Supplement.)
667	Canvas and Cotton:
	(Revised List, See Supplement.)
	Boughton Endless Thresher... 70%
	(Add 3 ft. extra for splice.)
	Boughton Stitched Canvas... 70%
	Roll Lots .....70-5%
	Victor White Woven Cotton.. 55%
668	Solid Round Leather:
	3/8-inch .....100 ft. 1.20
	1/2-inch .....100 ft. 1.40
	3/4-inch .....100 ft. 2.30
	7/8-inch .....100 ft. 3.80
	1-inch .....100 ft. 6.80
	Patent Round Leather:
	1/2-inch to 1-inch, incl. ....45%
	Twisted Round Leather.....50-10-5%
	Moran's Steel Belt Coupling...60-10%
	Boughton Belt Dressing.....lb. 30c
	Boughton Belt Cement.....lb. 75c
669	Rawhide Lace Leather.....sq. ft. 30c

Page Catalogue	Discount or Net Price
	BELTING—Continued.
	Champion Rawhide Cut Lace
	Leather .....50%
	Boughton Wire Belt Lacing..coil 25c
	Belt Clamps .....45%
670	Bristol's Steel Belt Lacing.....60%
	Jones' Belt Hooks.....70%
	Improved Belt Studs.....50-10%
	Alligator Steel Belt Lacing.....30%

PUNCHES:

671	Belt (Revised List, See Supp.). 70%
	Round .....40%
	Spring Belt .....50%
	Cutter, Awl and Pliers.....each 90c
	Cutters and Pliers.....each 40c
	Superior Belt Splicing Tool..each 25c
	Patent Belt Awl.....each 50c
	Lace Leather Cutter.....each 35c
	Belt and Packing Shears.....35%
	(Revised List, See Supplement.)

HOSE:

672	Rubber Conducting:
	Bullock .....60%
	Castor .....65%
	Helmer:
	(1-in, 3 and 4-ply only)....65-10%
673	Garden:
	Bullock:
	1/2-inch, 3 ply .....ft. 11c
	1/2-inch, 4 ply .....ft. 12c
	3/4-inch, 3 ply .....ft. 13c
	3/4-inch, 4 ply .....ft. 14c
	Helmer:
	3/4-inch, 3 ply .....ft. 10 1/2c
	3/4-inch, 4 ply .....ft. 12c
	1/2-inch, 3 ply .....ft. 9c
	Standard:
	3/4-inch, 4 ply .....ft. 8 1/2c
	1/2-inch, 4 ply .....ft. 7 1/2c
	Cotton Garden:
	Samson, 3/4-inch .....ft. 11c
	Harrison, 3/4-inch .....ft. 10c
674	Steam: (Revised List, See Supp.)
	Bullock .....50%
	Channon Special .....45%
	Channon's Dynamite, Special List (Advance Standard List two plies) .....25%
	Castor, 5 and 6 ply only.....60%
	Helmer .....Appl.
	Dynamite Steam Hose for High Pressure:
	(Revised List, See Supplement.)
	Hose .....25%
	Couplings .....50%
675	Air Drill: (Revised List, See Supplement.)
	Bullock .....60%
	Helmer .....70%
	Divers' Appl.
	High Pressure Air Drill.....50%
	(Advance Standard List 2 plies.)
	Pneumatic Tool or Air Hose.... Net
	(Revised List, See Supplement.)
	Brewers' .....50-10%
	(Steam Hose List.)
	Acid .....40%
	(Revised List, See Supplement.)
676	Flexible Steel Armored:
	In 50-ft. Sections.....25%

Page Catalogue		Discount or Net Price
	HOSE—Continued.	
	Cut Lengths.....	25%
	Couplings and Clamps.....	35%
677	Suction:	
	Bullock, Smooth or Rough Bore:	
	2, 2½ and 3-inch.....	70%
	4 inches and larger.....	65%
	Castor, Rough Bore only.....	Appl.
	Helmer, Rough Bore only.....	Appl.
	Hard Rubber.....	70%
	Hydraulic Mining.....	Appl.
678	DREDGING SLEEVES:	
	Special Prices Quoted on Qualities Suited to the Conditions.	
	CLOTH INSERTION TUBING:	
	¾-inch.....ft.	5c
	¾-inch.....ft.	6c
	¾-inch.....ft.	6½c
	¾-inch.....ft.	7½c
	¾-inch.....ft.	8½c
	¾-inch.....ft.	9½c
	PURE RUBBER TUBING:	
	S. M. White.....lb.	50c
	Antimony.....lb.	80c
	WINDINGS FOR STEAM, WA- TER OR AIR HOSE:	
	Round Wire.....add to list	10%
	Half-Round Wire.....add to list	15%
	Marline.....add to list	15%
	Painted Woven Jacket:	
	Advance List Two Plies.	
679	STERLING FIRE HOSE:	
	Single Jacket:	
	2 -inch.....ft.	50c
	2½-inch.....ft.	55c
	Double Jacket:	
	2 -inch.....ft.	60c
	2½-inch.....ft.	65c
	3 -inch.....ft.	Appl.
680	MILL HOSE: (Revised List, See Supplement.)	
	Sampson.....	60%
	Harrison.....	60-10%
	UNLINED LINEN HOSE:	
	2½-inch.....ft.	16½c
	2 -inch.....ft.	15½c
	1½-inch.....ft.	13½c
	1¼-inch.....ft.	11½c
	1 -inch.....ft.	10½c
	¾-inch.....ft.	8½c
681	PLAY PIPES AND NOZZLES:	
	Brass Swivel Handle.....	55%
	Brass Hose Nozzles, Screw Tip.....	60%
	Brass Hose Nozzles with Cocks.....	50-10%
	Plain Brass.....	65%
	Gum Garden.....each, \$0.30; doz.	3.00
682	COUPLINGS:	
	Regular Water Hose:	
	¾-inch.....set	.10
	Dozen.....	1.10
	1-inch.....set	.20
	Dozen.....	2.00
	1¼-inch and Larger.....set	60%
	Steam Hose.....	70%
	Suction Hose.....	60%
	IRON PIPE NIPPLES, for Suc- tion Hose:	
	2 -inch, wired in.....each	1.00
	2½-inch, wired in.....each	1.25

Page Catalogue		Discount or Net Price
	IRON PIPE NIPPLES—Continued.	
	3 -inch, wired in.....each	2.25
	4 -inch, wired in.....each	2.25
	5 -inch, wired in.....each	3.00
	6 -inch, wired in.....each	3.50
	8 -inch, wired in.....each	4.50
	EXPANSION RING COUPLINGS:	
	1½-inch, Marine.....set	1.35
	1½-inch, Heavy.....set	1.50
	2 -inch, Marine.....set	1.50
	2 -inch, Heavy.....set	1.65
	2½-inch, Marine.....set	1.75
	2½-inch, Heavy.....set	2.00
	EXPANSION RINGS:	
	1½-inch.....doz.	.90
	2 -inch.....doz.	1.25
	2½-inch.....doz.	1.75
	Spanners.....each	25c
683	Hose Nipples.....	60%
	Hose Reducers and Bushings.....	60%
	CLAMPS:	
	Hose:	
	½ and ¾-inch.....doz.	30c
	Larger.....	60%
	Extra Heavy, for Steam.....	60%
	Double Bolt.....	Appl.
	McChesney Bands and Tool (Re- vised List, see Supplement).....	50%
	Hose Valves.....	65-10%
	HYDRANT GATES:	
	Single.....each	8.00
	Double.....each	18.00
	Siamese Connections.....each	6.00
	For Stand Pipes.....	Appl.
684	Hose Reels and Racks.....	40%
	Reels for Garden Hose:	
	Metal.....each	1.50
	Wooden.....each	.75
685	HOSE CARTS:	
	Little Knox.....	40%
	Knox.....	40%
	Village.....	30%
	Special Heavy.....	30%
686	FIRE EXTINGUISHERS:	
	Standard, 3 gallon, with extra charge.....each	7.50
	Fire Department Pump, Copper, 5 gal.....each	7.00
687	SHEET RUBBER PACKING:	
	Red Raven, Red.....lb.	.55
	Roll Lots.....lb.	.50
	Hippo, Black.....lb.	.75
	Rainbow, Red.....lb.	.60
	Roll Lots.....lb.	.55
	Asbestos Wire Insertion.....lb.	.80
	SHEET RUBBER PACKING:	
688	Pure Gum Sheets.....lb.	.45
	Pure Gum Strips.....lb.	.50
	Cloth Insertion:	
	S Grade.....lb.	.16
	G Grade.....lb.	.13
	M Grade.....lb.	.10
	Gaskets and Rings.....lb.	.45
	GASKETS:	
	Keystone Red Tubular.....lb.	.50
	Asbestos:	
	Manhole.....lb.	.80
	Handhole.....lb.	.90
	Fraser Moulded Wire.....	1.00

Page Catalogue	Discount or Net Price	
689		PACKING:
		Keystone:
		Expansion Ring .....lb. Market
		Sectional Ring .....lb. Market
		Spiral .....lb. Market
		Channon's Moulded Piston:
		Ring .....lb. Market
		Spiral .....lb. Market
		Channon's Waterproof Hydraul-
		lic .....lb. Market
		Non-X-L .....lb. Market
		Channon's Diagonal .....lb. Market
		Hemp:
		Italian A .....lb. .15
		Italian B .....lb. .14
		American A .....lb. .13
		American B .....lb. .11
		Jute Gasket .....lb. .06
		Asbestos Sheet:
		J-M, not listed .....lb. Market
		Mobaline, not listed .....lb. Market
		Plumbago Laid Asbestos, Round:
		Palmetto, not listed .....lb. Market
		Sheet Packing:
		Regular Hub Oil Finish, not
		listed .....lb. Market
		Ebonite, not listed .....lb. Market
		Paranite, not listed .....lb. Market
		Jenkins' 96, not listed .....lb. Market
		Red Sheet:
		India Red, not listed .....lb. Market
		Skihi, not listed .....lb. Market
		Thermidor, not listed .....lb. Market
		Piston:
		Daniel's P.P.P., not listed .....lb. Market
		Peerless, not listed .....lb. Market
690		Flax:
		Sterling .....lb. .40
		No. 1 .....lb. .18
		Oval Braided Gum Core .....lb. .28
		Channon's Empire Gum Core .....lb. .28
		Square Duck:
		Black Friction and White
		Duck .....lb. .26
		Extra Fine Hard, White Friction
		and White Duck .....lb. .60
		Metalbestos High Pressure .....lb. .80
		Black Squadron:
		Coils .....lb. .75
		Rings .....lb. 1.00
		High Pressure Coils .....lb. 1.00
		High Pressure Rings .....lb. 1.25
691		Asbestos Wick .....lb. .23
		Asbestos Rope .....lb. .25
		ASBESTOS MILL BOARD:
		Full Case lots .....lb. .06
		Sheets, less than case lots .....lb. .08
691		PACKING—Asbestos Mill Board,
		Rolls .....lb. .06½
		Asbestos Building Felt Sheathing
		.....lb. .05
		Asbestos Cement Felting .....cwt. 1.25
		Asbestos Retort Cement .....Appl.
		Asbestos Pipe Covering .....Appl.
692		Moulded Rubber Goods .....Appl.
		(Special Prices Quoted on Qual-
		ities to suit the nature of the
		work.)
		RUBBER MALLETS:
		No. 1 .....each 50c
		No. 2 .....each 65c

Page Catalogue	Discount or Net Price	
		RUBBER MALLETS—Continued.
		No. 3 .....each 75c
		No. 4 .....each 90c
		Corrugated Matting .....lb. 16c
		In cutting irregular sizes, charge
		is made for the waste.
		PERFORATED RUBBER MATS:
		¼-inch .....sq. ft. 45
		¾-inch .....sq. ft. .55
		½-inch .....sq. ft. .65
		Plain, Red or White Letters .....each .25
693		RUBBER DIAPHRAGMS:
		Channon's or Loud's:
		No. 1 .....each 1.50
		No. 2 .....each 2.00
		No. 3 .....each 3.00
		Edson:
		No. 2 .....each 1.75
		No. 3 .....each 2.50
		No. 4 .....each 3.50
		Twentieth Century Discs .....25%
		(Revised List see Supplement.)
		Sheave Filling .....lb. .60
		PUMP VALVES:
		Soft .....lb. 55c
		Medium Hard .....lb. 65c
		Hard .....lb. 75c
		Leather Cups .....40-10%
694		OILERS:
		Copperized Steel, No. 12 to 16.. 75%
		Brass, No. 12 to 16..... 45%
		Acme Machinist 40%
		Zinc 65%
		Malleable Iron .....50-10%
695		Wall's Brazed Steel Bench..... 40%
		Extra Spouts 30%
		Brazed Steel Pyramid 50%
		Extra Spouts 30%
		Brazed Steel Locomotive..... 20%
		Extra Spouts Net
696		Coppered Steel Railroad..... 60%
		Extra Spouts 40%
		Brass Railroad 45%
		Extra Spouts 25%
		Howland Pump:
		Tin 65%
		Copper Plated .....65-10%
		Brass 60%
		Extra Spouts 40%
		Engineers' Tin: 40%
697		Tallow Pots, Steel..... 60%
		Brass 40%
		Inspectors' and Locomotive Torches 60%
697		Engineers' Fillers, Coppered Steel
		Brass 45%
		Steel Jacket Lamps 60%
		Engineers' Sets, Coppered Steel. 50-10%
		Brass 45%
698		Brazed Steel Torches, Screw Top
		Top Burner 40%
		Engineers' 25%
		Inspectors' Boiler 30%
		Tallow Pots .....doz. 8.00
		Car Oil Cans, 10-quart.....doz. 12.00
		4-quart .....doz. 9.50
		Dope Pails, 10-quart, with lip.....doz. 8.00
699		TANKS, Walton Oil:
		30-gallon .....each 3.00
		60-gallon .....each 3.50
		110-gallon .....each 5.50
		165-gallon .....each 8.50

Page Catalogue		Discount or Net Price
	TANKS—Continued.	
	Gasoline:	
	30-gallon	each 3.00
	60-gallon	each 3.50
	100-gallon	each 5.00
	165-gallon	each 8.00
	215-gallon	each 10.00
	Varnish:	
	30-gallon	each 3.50
	60-gallon	each 6.50
	110-gallon	each 6.50
	Wood Jacket Cans	55%
	TIN OIL OR TRANSFER PUMPS:	
	No. 1	each 1.30
	No. 2	each 1.50
	No. 3	each 2.55
	Oil Gates, Stebbins	75%
	Perfection	60-5%
	Petroleum Faucets	60%
	ZINC CAN SCREWS.	70%
	(Revised List, See Supplement.)	
700	Waste Cans, Standard	doz. 12.00
	Justrite	10%
	Corrugated	30%
	Ash and Waste Cans	60%
	BASKETS:	
	Galvanized Steel:	
	No. 1	doz. 11.00
	No. 2 1/2	doz. 12.50
	Nos. 2 and 3	30%
	Bamboo Coal	50%
701	Pressed Steel Shop Pans	Appl.
	Steel Tote Boxes	Appl.
	All Steel Barrels	Appl.
	Salamanders	70%
	Galvanized Steel Hoisting Buckets	30%
702	ONOKO BABBIT METAL ..lb.	16c
703	Babbitt Metals	Market
	Pig Lead	Market
	Sheet Lead	Market
	Block Tin	Market
	Bar and Wire Solder	Market
	Ingot Copper	Market
	Brazing Spelter or Solder	Market
	Brazing Compound or Flux	Market
	Borax	Market
704	Babbitt Melting Ladles, 3 to 5-in.	50%
	6 to 12-inch	10%
	COMBINATION MOULDS AND LADLES	Net
	(See Supplement.)	
	SOLDER POTS:	
	5-inch	each .25
	6-inch	each .30
	8-inch	each .80
	10-inch	each 1.30
	12-inch	each 2.00
	Pouring Pots	each 1.50
	FOUNDRY LADLES:	
	No. 122	45%
	No. 126	20%
	No. 128	40%
	No. 142	40%
	No. 150	40%
705	GASOLINE BRAZING FORGES:	
	No. 55	18.00
	No. 85	20.00
	No. 105	22.50
	No. 88, Adjustable	22.50

Page Catalogue		Discount or Net Price
	GASOLINE BRAZING FORGES—	
	Continued.	
	No. 530, Floor Pumps	2.50
	Crucibles	Appl.
	Copper Hatchet Bolts	per lb. .35
	SOLDERING COPPERS:	
	3 lbs. per pair and larger ..lb.	.25
	2 1/2 lbs. per pair	lb. .26
	2 lbs. per pair	lb. .27
	1 1/2 lbs. per pair	lb. .28
	1 lb. per pair	lb. .31
	Soldering Copper Handles:	
	Per Gross	2.25
	Per Dozen .....	.25
706	GAS SOLDERING FURNACES:	
	Lundy	each 7.25
	Superior	40%
	Gas Heaters for Soldering Coppers	Net
	GASOLINE FIRE POTS:	
	No. 1	each 6.00
	No. 5	each 4.50
	No. 10	each 3.75
707	Gasoline Blow Torches:	
	No. 29	each 3.25
	No. 30	each 3.50
	No. 31	each 3.75
	No. 32	each 4.00
	No. 38	each 3.50
	No. 8	each 3.00
	No. 48	each 4.00
	No. 14 Pocket Torch	each 1.75
	Each	Doz.
	Gasoline Banjo Torches, Tin	1.00 10.00
	Heavy Galvanized Iron	1.25 12.50
708	LANTERNS:	
	List on Hot Blast Lanterns with Green or Ruby Globes:	
	Each	Doz.
	No. 0 .....	.85 8.25
	No. 2	1.10 10.50
	Hot Blast, Cold Blast and Mill ..	35%
	No. 39 Standard Railroad	40%
	Globes (Revised List, See Supp.)	
	No. 0 Tubular White	doz. .65
	Ruby	doz. 1.75
	No. 2 Tubular White	doz. .90
	Ruby	doz. 2.25
	No. 0 Cold Blast White	doz. .75
	Ruby	doz. 2.00
	No. 39 R. R. White	doz. .90
	Ruby	doz. 1.75
709	LAMPS:	
	Square Station	33 1/3%
	Improved Tubular	35%
	Tubular Government, Guarded	
	Square	33 1/3%
	No. 20 Tin Tubular Cold Blast	
	Searchlights	35%
	Standard Headlights:	
	Fig. 19	each 8.50
	Fig. 20	each 17.50
	Fig. 21	each 18.50
	Fig. 48, 10-inch Round	
	Reflector	each 7.00
	Real End Tail	each 3.25
	New Dietz Dash. See Supplement.	
	page 29	Net
710	GLUE:	
	Le Page's Liquid	20%
	(Revised List See Supplement.)	
	Pots	20%

Page Catalogue	Discount or Net Price	
GLUE—Continued.		
	20%	Heaters, Burlington
	30%	Acme Steam and Stand
	15%	Kerosene
	10%	Extra Parts
	Appl.	Cups, only
711		PAILS:
		Galvanized, Regular:
	doz.	10-quart
	doz.	12-quart
	doz.	14-quart
	doz.	16-quart
	doz.	Galvanized, Extra Heavy:
	doz.	12-quart
	doz.	14-quart
	doz.	16-quart
	doz.	Galvanized, Cement
	doz.	Galvanized, Fire:
	doz.	10-quart
	doz.	12-quart
	doz.	14-quart
	Each.	Doz.
	55c	J. I. C. Wooden
	2.50	Common Pine:
	25c	Two-Hoop
	30c	Three-Hoop
	20%	Indurated Fibre
712		GRAPHITE:
		Dixon's Flake:
	each	1-lb. Cans
	each	2-lb. Cans
	each	10-lb. Cans
	lb.	25-lb. Boxes
	lb.	50-lb. Boxes
	lb.	100-lb. Kegs
	lb.	350-lb. Barrels
	lb.	Mexican Lubricating, No. 205
	lb.	1-lb. Cans
	lb.	5-lb. Cans
	lb.	10-lb. Cans
	lb.	25-lb. Boxes
	lb.	100-lb. Kegs
	lb.	325-lb. Barrels
	Appl.	Graphite or Plumbago
713		OILS:
	33½%	Cylinder
	40%	Engine or Machine
		Lubricating:
	Market	West Virginia Black
	Market	Zero Black
	33½%	Winter Black
	33½%	Summer Black
	Market	Lard
	Market	Illuminating
	8c	Boughton Boiler Compound, bbls., half bbls. and 100-lb. kegs.
	Market	Tallow
714		GREASE:
		Albany:
	20c	5, 10 and 25-lb Cans
	18c	50-lb. Cans
	16c	125-lb Kegs
	13c	½-bbl.
	12c	Barrels
	50%	Boughton Cup
	60%	Winfield Axle
		DEARBORN BOILER COMPOUND:
	.07½	Bbls.
	.08	½ bbls.
	.09	150 lb. Kegs

Page Catalogue	Discount or Net Price	
DEARBORN BOILER COMPOUND—		
Continued.		
	lb.	100 lb. Kegs
715	10%	Cross Oil Filter
	10%	Style B
	Market	TWINE, etc.
716		Quotation Sheets issued Monthly on Wrapping Twines, Sewing
719		Twines and Sash Cord will be mailed on application.
720		MOP HEADS:
		Eclipse or Common:
	lb.	Doz. Lots
	18c	Bale Lots
		Common Cotton:
	lb.	Doz. Lots
	Appl.	Bale Lots
	Each.	Doz.
	.35	Handled Mops
	10	No. 4 Mop Sticks
COTTON CANDLE WICK:		
	lb.	No. 1 5-lb. Sacks
	lb.	No. 1 100-lb. Bales
	lb.	Extra 5-lb. Sacks
	lb.	Extra 100-lb. Bales
BRAIDED TORCH WICK:		
	lb.	Coil Lots
	yd.	Cut Length, ¾-inch
	yd.	Cut Length, 5/8-inch
	each	Beach Mop Wringer
	Market	Bees Wax
721		COTTON AND WOOL WASTE
		Quotation Sheets issued Monthly will be mailed on application.
722		OAKUM:
	bale	Best Spun
	bale	Best Unspun
	bale	U. S. Navy
	bale	Navy
	bale	Plumbers'
		Spun Calking Cotton:
	lb.	No. 1 Broken Lots
	Appl.	Bale Lots
	20	Yacht Broken Lots
	Appl.	Bale Lots
	Each.	Doz.
	.35	Pitch Mops
	.75	Pitch Ladles, Iron Galvanized ea.
CANDLES:		
	lb.	Full Boxes
	lb.	Less Quantities
722		PINE TAR:
	Market	Full Bbls.
	each	Half Gal. Cans
	each	One Gal. Cans
	each	Two Gal. Cans
	each	Five Gal. Cans
		COAL TAR:
	Market	Full Bbls.
	each	½ Gal. Cans
	each	1 Gal. Cans
	each	2 Gal. Cans
	each	3 Gal. Cans
	each	5 Gal. Cans
		PINE PITCH:
	Market	Full Bbls.
	each	Boxes, about 8 lbs.
COMPOSITION OR COAL TAR		
PITCH:		
	Market	Full Bbls.

Page Catalogue		Discount or Net Price	Page Catalogue		Discount or Net Price
	COMPOSITION OF COAL TAR PITCH—Continued.			LUBRICATORS:	
	Boxes, about 8 lbs.....each	.25		Plain Engine	70%
	RESIN:			Class "F," Single Connection	40%
	Full bbls. ....Market			Swift	40%
723	Boxes, about 8 lbs. ....each	.40	729	Class "F," Double Connection	40%
	Calking Irons	20%		Swift	40%
	Hawsing Beetles	1.75		Hanson, Force Feed	8.50
	Calking Mallets	20%		Force Feed Pumps, for Feeding	
	Hawsing Irons	20%		Boiler Compound	55%
	Reaming Irons	Net		Hills-McCanna Lubricating Pumps:	
724	OIL CUPS:			Fig. 50	45%
	Plain Brass	75%		Fig. 60	55%
	Locomotive Pattern	70-10%	730	COCKS:	
	Plain Glass	65%		Air	70-10%
	Signal Snap Lever and Sight			Steam Gauge	70-10%
	Feed	80-10%		Cylinder	70-5%
	Detroit Glass Body, Nos. 51 to 56	85%		Compression Gauge	70%
725	Crank Pin Plunger Oilers	65-10%		Weighted Gauge	35c
	Cylinder Oil Pumps, Glass	60-5%		Steam Gauge Syphons	40%
	Hand	35%	731	WATER GAUGES:	
	Oil Hole Covers	50%		No. 3-0 to 1 .....	.90
	Brass Loose Pulley Oilers	25%		No. 1½	1.25
726	Plain Grease Cups, Steel	85-10%		Balance	70%
	Brass (Revised List, See Supp.)	85-10%		GENUINE MONCRIEFF SCOTCH GAUGE GLASSES:	
	POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS:			½ to ¾ in. Diam. 10 to 24 in long incl.	85%
	Renown	70-10%		Larger and Longer	60%
	Coin	50%		GAUGE GLASS WASHERS:	
	Bruno	50-5%		Per doz. ....	.10
	Colonial	60%		Per lb. ....	.75
727	DETROIT LUBRICATORS:			Gauge Glass Cutters:	
	Improved Standard:			Jelco	1.00
	¼ pint Capacity	3.75		Chesterton	1.35
	½ pint Capacity	4.15		Favorite .....	.25
	1 pint Capacity	5.70		Oil Cup Glasses and Washers	10%
	1 quart Capacity	7.70	732	GAUGES:	
	½ Gal. Capacity	11.25		Pressure and Vacuum:	
	1 Gal. Capacity	14.50		Bourdon Single Spring, 2½, 3½, 4½, 5 inch.	
	Improved Standard with Bracket:			Iron Case, Brass Ring	1.25
	½ pint Capacity	4.75		Other Sizes and Styles:	
	1 pint Capacity	6.30		Iron Case	75%
	1 quart Capacity	8.30		Brass Case	70%
	Zero, Single Connection:			Farm Engine	75%
	¼ pint Capacity	3.00	732	WHISTLES:	
	½ pint Capacity	3.35		Common Steam	60%
	¾ pint Capacity	3.75		Single Bell Chime Steam	50%
	1 pint Capacity	5.10		Three Bell Chime	50%
	1 quart Capacity	7.00	733	Bristol's Recording Gauges	15%
	Zero, Double Connection:			Moisture Proof Cases	15%
	¼ pint Capacity	2.85	734	CLOCKS:	
	½ pint Capacity	3.05		Byers Watchman's Portable ca.	35.00
	¾ pint Capacity	3.40		Lock Box Stations	1.50
	1 pint Capacity	4.90		Extra Dials:	
	1 quart Capacity	6.70		1 year's supply (box of 375)	2.00
	Style "C," Single Connection:			3 year's supply (3 boxes)	5.00
	¼ pint Capacity	3.50		Newman Watchman's Portable:	
	½ pint Capacity	3.75		For 9 Stations	55.00
	¾ pint Capacity	4.15		For 10 stations	60.00
	1 pint Capacity	5.70	735	TUBE EXPANDERS (Revised List, see Supplement):	
	1 quart Capacity	7.90		Prosser's Pattern Spring	70%
728	Glass Body Gas Engine	80%		Special Ideal Self-Feed Roller	50-10-10%
	Sight Feed:			Wiedeke Roller Dudgeon Type	80%
	¼ pint Capacity	3.05		Beading Tools	50c
	½ pint Capacity	3.35		Dayton Roller Expanders	70%
	¾ pint Capacity	3.55		Ideal Self-Feed Tube Cutter:	
	1 pint Capacity	5.15		2 to 4 inch	35%
	1 quart Capacity	6.80		4¼ to 6 inch	25%
				Butman Patent Flue Cleaner Rods	40%

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
736	FLUE CLEANERS:		VALVES—Continued.
	Pilley's Combination		Iron Body Water
	Engineers' Favorite		80-10%
	Abram's Expansion	749	Safety, Brass Pop:
	Flat Steel		Fig 1
	Globe		80-10%
	Thompson's Soot Ejector		Fig. 2 and 3
	Magic Flue Blower		80%
737	Penberthy Injectors, Entire Page.		Self-Adjusting Pop Regular
738	Hancock Inspirators		75-10%
	70-10%	750	Standard Iron Body, Brass Seat
			80-10%
	INJECTORS:		Eclipse Safety Water Columns
	U. S. Automatic		33 1/3%
	World		IMPROVED STEAM CONDENS-
739	Model "N" Automatic		ING EXHAUST PIPE HEADS:
	"G" Double Tube		1 1/2-in. to 8-in.
	"O" Double Tube		75-10%
	"T" Flanged		9 -in. to 18-in.
	35%		70-5%
740	EJECTORS:	751	Pressure Regulators:
	XL-96 Improved		(Revised List, see Supplement.)
	H-D 1898		No. 1
	Hancock, or Jet Pump		30-10%
	80%		No. 2
741	JET PUMPS, Blakeslee Steam:		40-5%
	1 1/2-inch and smaller		No. 3
	80-10%		50%
	2 -inch and larger		VALVES:
	75-10%		Back Pressure
	Drive Well		65-10%
	American Ejector (Revised List,		Patented Noiseless
	see Supplement)		33 1/3%
	75-10%	752	STEAM TRAPS:
742	GARDNER ENGINE GOVERNORS:		Nason
	2 1/2-inch and smaller		65%
	30%		Davis
	3 -inch and larger		40-10%
	25%		Peters' Corliss Valve
	ENGINE ROOM CLOCKS:		25%
	Seth Thomas		Kieley
	Boston		40%
	Howard	753	SEPARATORS:
743	VALVES:		Pittsburg
	Standard Brass Screwed Globe		60%
	Angle and Cross		Eclipse Steam
	60-5%		60%
	Standard Brass Screw Check:	754	Victor Steam, 2 to 8-inch
	Cup Pattern		65%
	65-10%		Victor Oil, 9 and 10-inch
	Standard Swing		60%
	75%		Vater's Two Stage
	Horizontal, Angle and Vertical		50%
	60-5%	755	PIPE:
	Standard Iron Body, Brass		Standard Wrought
	Mounted, Screwed		Market
	70%		Extra Strong
	Flanged		Market
	70%		Double Extra Strong
744	Genuine Jenkins Bros.:		Market
	Brass, Globe and Angle		Threading
	50-5%		40%
	Cross		Standard Steel Boiler Tubes
	50%		Market
	Horizontal, Angle and Verti		Cutting to order
	cal Check		Appl.
	50-5%	756	Spiral Riveted
	Extra Heavy, Globe and		50-10%
	Angle	757	Flanges, Bolts and Gaskets
	40-10%		50-10%
	Check		Flanged Fittings
	40%		50-10%
745	Standard Iron Body, Globe	758	Cast Iron, Water
	and Angle		Market
	50-10%		Flanged
	Horizontal Angle and Verti		Market
	cal Check		Fittings
	50-10%		Market
	Standard Brass "Y" Blow		Gas
	Off		Market
	40-5%		Fittings:
	Discs for Jenkins' Valves	759	Standard Malleable Iron
	(Revised List, See Supp.)		70%
746	Powell's Star		Cast Iron
	45%		65%
	Lever Throttling	760	Return Bends:
	55%		Mall. Iron, Close or Medium
747	Standard, Brass Straightway or		Patterns
	Gate		70%
	65%		Open Pattern
	Iron Body Straightway or Gate		70%
	70%		Special Wide Pattern
	Butterfly, Brass		70%
	70-10%	760	Cast Iron, Close Pattern
	Iron Body		65%
	70%		Open Pattern
	Safety, Brass		65%
	70-5%		Back Outlet
	Iron Body		65%
748	Relief, Brass Water and Cylinder		Cast Iron Branch Tees
	80%		70%
		761	Nipples:
			Up to 2 1/2 inches
			80%
			Larger Sizes
			75-10%
			Standard Wrought Iron Coup-
			plings
			66 2/3%
			Railing Fittings:
			Black
			lb. 10c
			Galvanized
			lb. 14c
			Reducing Sizes
			15% Advance
		762	Flexible Joints, Barco
			60%
			Moran
			Net

Page Catalogue		Discount or Net Price	Page Catalogue		Discount or Net Price
PIPE—Continued.			SHOVELS—Continued.		
763	Pipe Hangers	75%	770	Moulders:	
	Extra Parts for Expansion ..	75%		Bullock	50%
	Hook Plates	70-10%		Winfield	50%
	Expansion	70-10%		Van Kleeck ..	50% plus 50c doz. Net
	Beam Hooks, Long Shank ..	70-10%		Bullock Concrete	50%
	Fusible Plugs	70-10%		Telegraph, Bullock	50%
	Malleable Pipe Rings	70%		Winfield	50%
	Climax Steam Joint Clamps ..	25%		Telegraph Spoons, Bullock ..	50%
	Emergency Pipe Clamps	25%		Winfield	50%
764	Flanges, Cast Iron	70-10%	771	Plain Black Western Mining:	
	Standard Companion	75-10%		Winfield	50%
	"Y" Bends, Cast Iron	65%		Bullock	50%
	Mall. Iron	70%		Plain Black Irrigating, with Step:	
	60 Degree M. I.	70%		Winfield	50%
	Ceiling Plates, Split	75%		Bullock	50%
	One Piece	75%			
	Crane Floor Plates	75%		SPADES:	
765	Standard Steam Cocks:			Bullock	50%
	Brass	70-10%		Helmer	45%
	Iron	70%	772	Ditching and Drain:	
	Unions, Screwed:			Winfield Ditching and Drain	
	Standard Mall	70%		Spades:	
	Mall. with Brass to Iron Seat ..	70-10%		Length of Blade. Each. Doz.	
	Mall. Extra Heavy	65-10%		14-inch	\$1.90 \$19.00
	Brass Plain	70%		16-inch	1.95 19.50
	Brass Semi-Finished	65-10%		18-inch	2.00 20.00
	Brass Finished	60%		20-inch	2.05 20.50
	Flanged:			Discount on above list	50%
	Cast Iron	70-10%		Bullock	50%
	Mall. Iron	75-10%		Goodman	45%
	Cast Iron, Extra Heavy ..	70%		Skeleton	40%
	Cast Iron, Ex. Heavy Iron			Champion Drain Cleaners	40%
	to Brass Seat	50%	773	Hollow-Back, Chisholm Pattern:	
766	VENTILATORS AND CHIMNEY:			Boughton	50%
	Tops:			Kongo	45%
	2 to 9 inches	65%		Hollow-Back "D" Handle Spades:	
	10 to 12 inches	65-10%		Boughton	50%
	14 to 20 inches	70-5%		Kongo	45%
	24 to 30 inches	75%	774	Hollow-Back Coal and Coke:	
	36 inches	75-10%		Boughton	50%
	Revolving and Ventilating Chimney			Kongo	45%
	Caps, complete	35%		Hollow-Back Ore:	
	Iron Mountings without Cover ..	35%		Boughton	50%
	Boiler Room Tools	25%		Boleo	45%
	Economy Firing Tools	15%	775	SCOOPS:	
767	EXHAUST HEADS:			Hollow-Back:	
	Burt	20%		Boughton	50%
	Standard	20%		Kongo	45%
768	BROOMS:			Winfield, Back Strap	40%
	All Corn, 36 pounds	doz. 3.75	776	Ames Coal	10%
	All Corn, 40 pounds	doz. 4.25		Ames "V" Pointed	10%
	Mixed Corn, 36 pounds	doz. 3.50		Reeds "D" Handle Trimmer or	
	Mixed Corn, 40 pounds	doz. 4.00		Bag	10%
	Mixed Corn, 48 pounds	doz. 5.00		Ames Plain Back	10%
	Street or Push	40%		Furnace Scoops	45%
	Handles for Street or Push ..	doz. 40%		Snow Shovels	45%
	Steel Wire Push	50%		Sidewalk Scrapers	45%
	Chill or Frog and Handles	40%		Turf Edgers	40%
769	SHOVELS:		778	HANDLES:	
	Standard:			Shovel, Spade and Scoop	40%
	Bullock	50%		Malleable "D," Iron Grip ..	doz. 1.00
	Winfield	50%		Wood Grip	doz. 1.25
	Van Kleeck ..	50% plus 50c doz. Net	779	Bullock Brand Forks, Entire Page	40%
	Goodman	45%	780	Hop or Stone Hooks	60%
	Helmer	45%		Asphalt or Tar Rakes	50-10%
	Sewer or Brick, Bullock	50%	780	TWO-MAN RAKES:	
	Salomonie	50%		10 tooth	doz. 22.50
				12 tooth	doz. 25.00
				14 tooth	doz. 27.50

Page Catalogue	Discount or Net Price	Page Catalogue	Discount or Net Price
781	HOES:	WHEELBARROWS—Continued.	
	Mortar: Each. Doz.	No. 37 Steel Bottom Stone	4.50
	No. 60 ..... .50 5.75	787 No. 2A Columbus Steel	
	No. 61 ..... .60 6.25	Tray ..... .3.50 39.00	
	Garden or Field 70%	Extra Trays 2.25	
	Railroad Shuffle 65%	Extra No. 13A Wheels. .85	9.00
	Garden Shuffle 65%	Columbus Extra Heavy	
782	PICKS:	Tubular Steel:	
	Railroad or Clay:	No. 9X 9.75	
	With Tool Steel Points.....70-10%	No. 9X Extra Trays.. 3.50	
	Standard, Fig. 33 .....75-10%	No. 17 .....12.50	
	Railroad Tamping, Fig. 35..... 75-5%	No. 17 Extra Trays.... 5.25	
	Drifting, Fig. 38.....70-10-5%	788 Columbus Tubular Steel:	
	Short Ear Coal, Fig. 46 70%	No. 4 3.25 36.00	
	Poll, Fig. 39 .....70-10%	No. 4½ 3.70 42.00	
	(Revised List see Supplement.)	No. 5 3.65 41.00	
	MATTOCKS:	No. 6 3.95 44.50	
	Adze Eye, Fig. 51.....75-10%	No. 7 4.25 48.50	
	Pick, Fig. 52 75%	No. 8 3.90 44.00	
	Special Asphalt: Each. Doz.	No. 9 4.75 54.00	
	Fig. 55 with Tool Steel	No. 10 5.75 66.00	
	Points ..... .90 9.00	No. 12 4.75 54.00	
	Fig. 56 with Double Cutter .60 6.00	Extra Trays and Wheels:	
	HOES:	No. 4 Trays 1.50	
	Grub, Fig. 53 .....75-10%	No. 4½ " 1.90	
	Special Contractors' Cais-	No. 5 " 2.25	
	son: Each. Doz.	No. 14 Wheels for above... .90 10.00	
	Heavy Pattern ..... .60 6.00	No. 6 Trays 1.90	
	Extra Heavy Pattern.... 1.50 15.00	No. 7 " 2.25	
783	TOOL HANDLES: (Revised List	No. 8 " 2.50	
	see Supplement.)	No. 9 " 2.75	
	Full Grates 75%	No. 10 " 3.50	
	Less Quantities 70%	No. 12 " 2.75	
784	WHEELBARROWS:	No. 15 Wheels for above... 1.00 11.00	
	Note—Special quotation on doz.	789 Locomotive Coaling Appl.	
	lots of wheelbarrows does not	Steel Charging Appl.	
	include setting up. Each. Doz.	Stirling Concrete Cart each 18.00	
	Monarch Full Bolted	Steel Coke Buggy Appl.	
	Wooden Railroad 1.75 18.00	790 Standard Spring Brick Truck, each	12.50
	No. 96 Bolted Wooden	BRICK BARROWS: Each.	
	Mortar with Steel Wheels 2.75 27.50	No. 113 with Wooden Wheels... 4.00	
	No. 36 Bent Handle, Wood,	No. 113 with Steel Wheels.... 4.25	
	Stone 3.25 35.00	No. 114 with Wooden Wheels... 4.25	
	No. 97 Folding Wooden.... 3.00 32.50	No. 114 with Steel Wheels.... 4.50	
785	Steel Tray, Wood Frame,	No. 117 Spring Tile or Brick Bar-	
	Improved:	rows 5.00	
	"Pan-American" with Each. Doz.	HODS: Each. Doz.	
	Angle Iron Legs..... 3.25 35.50	Wooden, Mortar ..... .90 9.00	
	Extra Trays 2.00	Wooden, Brick ..... .70 7.00	
	Extra No. 13A Wheels. .85 9.00	Steel, Mortar, No. 158..... 1.20 12.00	
	Bullock 2.75 30.00	Steel, Brick, No. 162..... 1.00 10.00	
	Extra Trays..... 1.75	TRUCKS:	
	Extra No. 13A Wheels... .85 9.00	791 Railroad: Each.	
	No. 2B Columbus Con-...Each. Doz.	No. 4 5.50	
	tractors' 3.75 42.00	No. 4X 6.00	
	Extra Trays 2.25	No. 4XX 7.25	
	Extra No. 13A Wheels. .85 9.00	Store and Warehouse:	
786	K. & J. Concrete and	No. 1 Half Ironed 2.35	
	Mortar 4.00 45.00	No. 2 Full Ironed 3.40	
	Extra Trays 3.65	No. 3 Full Ironed 4.90	
	Extra No. 14 Wheels... .90 10.00	Barrel, Western Pattern 4.25	
	Columbus Improved Steel	Bag 1.75	
	Tray, Wood Frame with	Handy 1.60	
	Angle Iron Legs:	Skids ft. .50	
	No. 2 3.40 37.50	792 Hercules Steel Warehouse Truck:	
	Extra Trays 2.25	No. 3 5.00	
	Extra No. 13A Wheels. .85 9.00	No. 4 6.25	
	Each. Doz.	No. 4A 7.50	
	No. 3 4.00 45.00	Hercules Steel Barrel: Each.	
	Extra Trays 3.25	No. 3 6.25	
	Extra No. 13A Wheels. .85 9.00		

Page Catalogue		Discount or Net Price
TRUCKS—Continued.		
	No. 4	7.50
793	Improved, Figure 500:	
	A	10.00
	B	11.50
	C	11.75
	D	13.00
	Favorite Factory:	
	No. 2, 6.00	No. 3 9.00
	Dry Goods:	
	No. 1, 10.75	No. 2 11.25
	Regular Wagon:	
	No. 1 No. 2 No. 3 No. 4 No. 5 No. 6	
	6.50 6.75 7.25 8.00 8.75 10.00	
	Baggage and Express Wagons:	
	No. 1, 33.50	No. 2 22.50
	Baggage Wagons, Figure 258:	
	No. 1, 36.00; No. 2, 39.00; No. 3	41.50
	Box:	
	No. 1, 2.25	No. 2 2.50
794	HOOKS:	
	Sterling Standard Railroad and Contractors' Cant:	
	Each. Doz.	
	No. 58	1.00 9.75
	No. 57	1.25 12.50
	No. 56	1.50 15.50
	Sterling Wrought Steel Clasp Cant:	
	With 2½-inch Dia. Handles. 60%	
	With 3-inch Dia. Handles. 65%	
	With 3 -inch Dia. Handles. 65-5%	
	STERLING MALLEABLE SPLIT SOCKET PEAVIES:	
	With 2¾-inch Dia. Handles...60-10%	
	With 3 -inch Dia. Handles...65-10%	
	No. 106 Sterling Lug Hooks or Timber Carriers	65-10%
	LUMBERING TOOLS:	
795	Extra Parts	50%
	Cant Hook and Peavy Handles:	
	Rock Maple	25%
	Hickory	25%
	Lug Hook Handles	25%
	(¼ and 5 ft. are Standard lengths.)	
796	Ash Pike Poles	50%
	Handles Only	40%
	Pickaroons	50%
	Hookaroons, with Axe Handles. 50%	
	Steel Hooks:	
	Loading	50%
	Swamp	50%
	Tongs:	
	Skidding	50%
	Giant	50%
797	Timber Trucks or Dollies:	
	No. 1 (¼-in. dia. roller).each	3.25
	No. 2	3.50
	No. 3	4.00
	No. 4	5.50
	No. 5	7.75
	Dollies, Concave Face	5.25
	No. 7 Horseshoe	3.00
	Rollers:	
	Universal Bogie	20%
	No. 9 Side	7.50
	No. 8 End	2.75
	Log Binders	50%

Page Catalogue		Discount or Net Price
798	LINEMEN'S TOOLS:	
	Raising Forks or Wood Each Doz.	
	or Iron Poles.....50% 60%	
	Pike Poles.....40% 40-10%	
	Crow or Tamping Bars....40% 50%	
	Jenney Pole Supports 45%	
	Paving Rammers..... 33¼%	
	Post Hole Diggers..... 40%	
	POST HOLE AUGERS: .. Each Doz.	
	Regular	50% 60%
	Extra Heavy..... 70%	
799	JACKS:	
	Locomotive or Screw Jacks....70-10%	
	Car Box Jack Screws..... 65-5%	
	Bell Base Ratchet Jack Screws. 65-5%	
	Tripod Ratchet	65-5%
800	Barrett Lifting:	
	No. 1 to 5..... 70%	
	No. 6 to 51, except 29, 30 and 31	65%
	Nos. 29, 30, 31, Geared Ratchet50-10%	
801	No. 502 Two Ton Lever.....each 7.00	
	No. 4 Three Ton Barth.....each 4.50	
	Pearson Car Replacing..... 30%	
	Jenne Friction Track.....50-10%	
	Malleable Iron Wagon, New	
	Samson	50%
	Oliver	50-10%
	No. 00 Automobile or Wagon, ea. 3.00	
802	Channon's Steam Boat Ratchets or Pulling and Pushing..... 40%	
	Pearson Pulling and Pushing:	
	Nos. 1 and 2..... 30%	
	Nos. 3 and 4..... 25%	
	House Raising:	
	Standard Size, 3x24.....each \$1.60	
	Other Sizes	50-10%
	Hard Maple Wagon.....50-10%	
803	Channon Improved Stone and Machinery:	
	Iron Frame, Common..... 40%	
	Iron Frame, Self Lubricating. 35%	
	Wood Frame, Common..... 25%	
	Wood Frame, Self Lubricating 20%	
804	Norton Ball Bearing Bridge.... 20%	
	Buda Ball Bearing..... 25%	
	Telescopic Steel Jack Screws... 50%	
805	Hydraulic, Plain, Broad Base and Claw Styles on Page 805:	
	4, 7, 10 and 15 Ton Sizes..... 40%	
	20 and 30 Ton Sizes..... 40-5%	
	40 and 50 Ton Sizes.....40-10%	
806	Key Release Claw Hydraulic... 35%	
	Horizontal or Low Hydraulic:	
	7, 10 and 15 Ton Sizes..... 33¼%	
	20 and 30 Ton Sizes..... 35%	
	40, 50 and 80 Ton Sizes..... 40%	
	Car Brass Hydraulic..... 35%	
	"W-S" Outside Pump Vertical Hydraulic	35%
807	Extensible Trench Braces and Fittings	15%
808	Union Trench Braces and parts 15%	
809	JOHNSON'S WRECKING FROGS OR CAR REPLACERS:	
	(Revised List see Supplement.)	
	Style M	pair 10.00
	Style C	pair 12.50
	Style B	pair 16.50
	Style A	pair 18.50

Page Catalogue		Discount or Net Price
	JOHNSON'S WRECKING FROGS OR CAR REPLACERS—Continued.	
	Style Z	pair 20.00
	Style AA	pair 33.00
	F. O. B. Cleveland, O.	
	ALDON CAR REPLACERS:	
	No. 1	pair 16.00
	No. 2	pair 15.00
	No. 3	pair 12.00
	No. 4	pair 9.50
	No. 5	pair 5.00
	Samson Car Movers	each 5.00
	Extra Parts	Net
	Easy Steel Car Pushers	5.00
	Extra Shoes	each 1.75
	Extra Steels	each .20
810	Steel Rails	Market
	RAIL BENDERS:	
	Samson	each 53.00
	Jim Crow:	
	No. 1	each 17.00
	No. 2	each 15.00
	No. 3	each 11.25
	No. 4	each 9.25
	No. 5	each 7.75
	Roller Rail Benders and Straight- eners	45%
811	BARS:	
	Crow	lb. .04
	Lining	lb. .04
	Claw Goose Neck	lb. .06
	Claw, with Heel	lb. .06
	Railroad Tamping	lb. .04½
	Carpenters:	
	Claw	40%
	Goose Neck	40%
	Baby Pinch	40%
812	TRACK DRILLS:	
	Climax	20%
	Paulus	20%
	Moore	20%
	RAIL DRILLS:	
	Beland:	
	Drill Complete	each 2.75
	Ratchet Only	each 1.50
	Bit Only	each .10
	Schuttler	each 15.00
813	TAMPERS WITH HANDLES:	
	Style No. 1 Steel Plate	25%
	All Other Styles	35%
	CHANNON HUNTINGTON	
	TRACK GAUGES:	
	Standard with Single End	90 9.00
	With Double End	1.00 10.50
	Guard Rail Attachment	1.50 15.00
	No. 70 Wood Track Levels	1.50 15.00
	No. 75 Combined Track Gauge and Level	3.00 30.00
	TRACK TOOLS:	
	Mauls	lb. .05½
	Chisels	lb. .12
	Punches	lb. .12
	Railroad Track Tongs	lb. .07½
	Rail Forks	lb. .07
814	CHANNON'S BRIDGE BUILD- ERS' AND STRUCTURAL STEEL ERECTORS' SPE- CIAL TOOLS:	
	Riveting, Flogging and Napping Hammers:	

Page Catalogue		Discount or Net Price
	CHANNON'S BRIDGE BUILDERS' AND STRUCTURAL STEEL ERECTORS' SPECIAL TOOLS— Continued.	
	Figure 100	each 1.25
	Figure 101	each 1.50
	Figure 102	each 1.25
	Cutting Tools:	
	Figure 95	each .80
	Figure 96	each .80
	Figure 97	each .80
	Figure 98	each .80
	Figure 99	each .85
	Riveting Dollies:	
	Figure 108	each 2.75
	Figure 109	each 3.25
	Figure 110	each 5.00
	Figure 112	each 4.50
	Half Round Reamers, Fig- ure 106	
	Hand Gouges, Figure 107	each .65
	Hand Chisels	each .35
	Special Rivet Tongs, Figure 103	pair .70
	Special Riveting Clamp, Fig- ure 104	each 3.75
	Rivet Snaps or Sets, Figure 92:	
	¾-in. to ¾-in.	each 1.20
	¾-in.	each 1.25
	¾-in.	each 1.40
	1-in.	each 1.50
	Drift Pins—Barrel Shaped, Figure 93:	
	¾-in.	each .10
	¾-in.	each .11
	¾-in.	each .12
	¾-in.	each .16
	¾-in.	each .17
	1½-in.	each .19
	Backing Out Punches, Fig. 94:	
	¾-in. to ¾-in. inclusive, each	.80
	¾-in. to 1 in. inclusive, each	.85
815	DRILLS:	
	Champion Blacksmiths':	
	No. 92	each 4.50
	No. 93	each 7.75
	No. 93 (for Power)	each 9.75
	No. 96	each 9.25
	No. 96 (for Power)	each 11.25
	No. 98	each 5.75
	No. 98 (for Power)	each 7.75
	Champion No. 7 Improved	each 25.00
	Champion No. 7 Improved (for Power)	each 27.50
	Champion Ball Bearing Black Diamond	each 16.00
	Champion Ball Bearing (for Power)	each 18.50
816	Champion Automatic Self- Feed and Lever Feed	40%
	(Revised List see Supplement.)	
817	Western Chief Blacksmiths' Post:	
	No. 7 (for Power)	each 24.50
	No. 7 (without Pulleys)	each 22.50
	No. 16 (for Power)	each 31.50
	No. 16 (without Pulleys)	each 29.50
	No. 17 (for Power)	each 41.50
	Special Wheel Holder	each 1.50

SECOND HAND

Pumps, Engines, Etc.

which we have taken in trade and
which we, therefore, offer at
attractive prices.

LOOK THE LIST OVER!

1—3x2x3 Deane Duplex brass fitted pump.....	\$ 17.00
2—No. 4 Knowles 5½x3¾x7 single boiler feed pumps, brass fitted, 2" suction, 1½" discharge, each.....	45.00
1—No. 4 Knowles, as above, but iron fitted.....	33.00
1—F. C. Wells, size "D," iron fitted, 6x3¾x8 single boiler feed pump, 2" suction, 1½" discharge.....	30.00
1—14x10½x10 Dean (of Holyoke) Duplex plunger and ring pattern, brass fitted, 8" suction, 7" discharge, water pressure 150 lbs., capacity 562 to 936 gals. per min.....	350.00
2—14x8½x10 Worthington Duplex plunger and ring pattern, iron fitted, 6" suction, 5" discharge, water pressure 150 lbs., capacity 516 gals. per min.....	275.00
1—Fig. 150, 4x8 American Deep Well pump head.....	18.00
1—8¾x12 Buckeye Automatic engine.....	275.00
1—9½x10 Armington-Simms Automatic engine.....	285.00
1—Crane 8x10 D. C. Freight Elevator engine.....	350.00
1—No. 9 Sturtevant blower.....	70.00

SPECIAL BARGAINS IN NEW MACHINERY

1—15 H. P. Akron Motor, 220 volts D. C., 1100 R. P. M.....	\$200.00
1—Boiler Makers' Hand punch, 15" throat, capacity ¾ in ½ with architectural jaw	95.00
1—No. 3 Werner Hand Punch, 1 3-16 in 9-16.....	225.00
1—No. 66 6" stroke Imperial Air hammer.....	40.00
5—One-ton Longs bottom Dump buckets, 1½ yards, each..	80.00

H.Channon Company.

Market and Randolph Sts.,

Chicago.

Sept. 20th, 1910.

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MARKET AND RANDOLPH STREETS
Chicago, Ill., U. S. A.

Catalog No. 50.

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Chicago.

Catalog No. 50.



WE have exercised great care in compiling this catalog, using the latest list prices, up to the time of its going to press, but as changes are continually being made (some important ones may take place before this book reaches our customers) we must reserve the right to invoice all material at the prevailing list prices in force on date of sale.

All prices are quoted f. o. b. cars, Chicago, unless by special agreement, and we, therefore, are not responsible for goods lost or damaged in transit.

We do not ship C. O. D. orders, unless accompanied by 25% of the amount of the order.

All orders are accepted subject to delays occasioned by accidents, strikes, fires or causes beyond our control, and with the understanding that while goods proving defective will be replaced, no claims for damages or labor will be allowed.

No goods taken back and credited unless our consent has first been obtained.

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When ordering or asking for quotations on special tools or supplies, send a sample or sketch, with all dimensions and essential information indicated thereon.

All orders sent us will receive careful and prompt service, with intelligent attention to details.

IN this, our No. 50 catalog, we feel that we are presenting the best and most complete book that we have ever issued. It is complete in detail, concise, and so arranged and classified as to cover in a most brief and comprehensive manner, the various lines of machinery and supplies we handle.

In arranging our records and collecting the necessary data, we have carefully considered the product of the different manufacturers, and after analyzing the claims of each have selected for our catalog the articles which in our judgment are best suited to serve the purpose for which they are intended.

The descriptions have been carefully prepared to cover the essential points clearly and concisely, and to represent all goods exactly as they are.

All lists and tables have been revised up to the date of going to press and have been so arranged and tabulated as to make them, we believe, quickly understood and easily read.

No trouble or expense has been spared to make the illustrations as near as possible exact reproductions of the goods themselves.

Care has been used in compiling the index to make it complete for ready reference, and in assembling the entire book we have endeavored to classify each different line of goods in the most appropriate grouping.

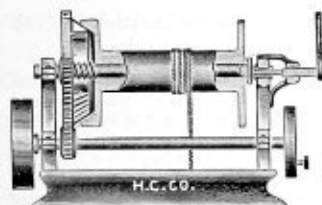
“MUNDY” HOISTING ENGINES.

FOR THIRTY-FIVE YEARS THE STANDARD OF ALL HOISTING MACHINES.

We are Western Selling Agents.

Large Stock Carried in Chicago.

More good material, honest and skillful workmanship goes into the manufacture of Mundy Engines than into any other—none excepted.



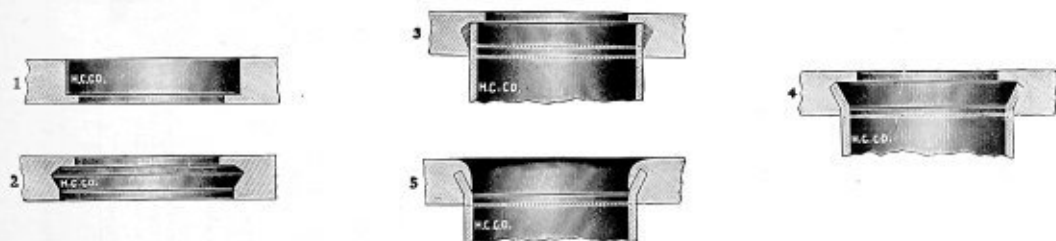
Mundy Friction Drum.

The Original Mundy Patent Friction Drum (invented by J. S. Mundy) has proven itself to be the best device ever introduced or applied to a hoisting engine, to which thousands of bridge builders, contractors, railroad and mining companies and others in all parts of the world are ready to testify.

The essential features of this perfect Friction Drum are ease and rapidity of action in taking and releasing friction, freedom from liability to stick, and a perfect control, by the operator, of the required intensity of pressure, under the varying conditions of load and speed, so that the drum may be made to revolve fast or slow with engine running at same speed, hold fast and revolve with the shaft, or go slower than the shaft, or let go and turn, either fast or slow, in a direction contrary to the revolution of the shaft, thus giving the operator, by the sense of feeling conveyed by the hand lever, absolute knowledge of what is needed to perfectly control the load.

Every part entering into the construction of the engine is made of the best material obtainable. The piston rods are of steel. The guides and cross-heads are of the locomotive type, having large wearing surface and are impossible to get out of line. The steam cylinders have large ports, thereby making the engines very quick and saving back pressure in the exhaust. The cylinders are fitted with solid pistons and self-adjusting packing rings, always perfectly tight and requiring no attention. A plain slide-valve is used that can be adjusted or set by any engineer. All the gears are cast from iron-cut patterns and are perfectly true; the pinion is made of cast steel. All of the gears are provided with guards, making it impossible for anything to come in contact with the gearing. The connecting rods being long, prevent friction on the guides and unnecessary strain on the working parts of the engine. The connections are all straight and only three in number, i.e., cross-head, crank-pin and valve-rod.

ALL BOILERS HAVE THE “JERROLD” PATENT METHOD OF SETTING TUBES.



The above engraving exhibits the successive steps in the process of setting the tubes.

Fig. 1 shows the tube sheet counterbored so as to leave an internal flange on the face side of the tube sheet.

Fig. 2 shows the hole grooved to receive the flared end of the tube.

Fig. 3. The end of the tube is in position to be flared, as shown in Fig. 4.

In Fig. 5, the tube setting is shown complete, the flange of the tube sheet having been set down upon the flaring end of the tube.

No more leaky tubes—All boilers warranted not to leak in top head even if the tubes should be fired to a red-hot heat; the fact is, they absolutely cannot leak. All boilers made of homogeneous steel, 60,000 lbs. T. S. of shell with vertical seams double riveted. Best flange fire-box steel in heads and furnace. The heads are extra heavy. The door frame is made of best forged steel and on the best principle. It has taken years of experience to get a door frame that will not leak. The boilers are all easy steamers.

The “Mundy” has the record for long service in constant use. It requires fewer repairs than any engine made. We show only a few standard styles in this book.

Send for complete catalog.

STANDARD ENGINE FOR RAILWAY, CONTRACTORS AND QUARRY USE.

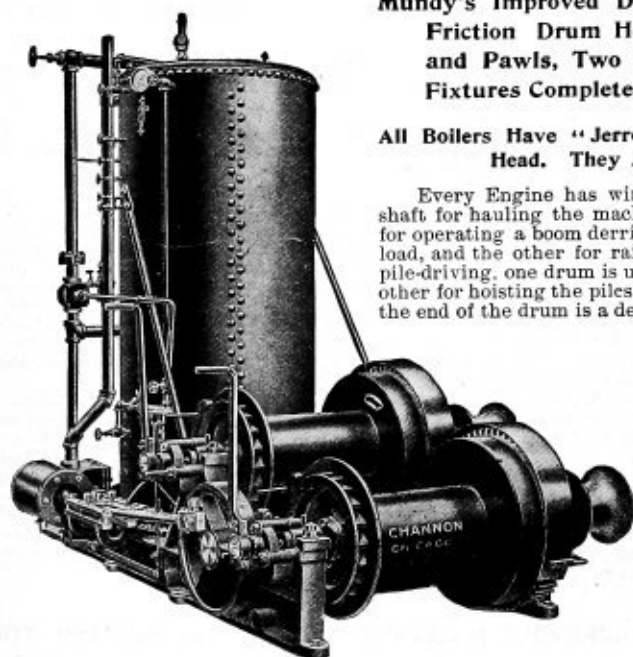
Mundy's Improved Double Cylinder, Double Patent Friction Drum Hoisting Engine, with Ratchets and Pawls, Two Winch Heads, Boiler and all Fixtures Complete, including Foot Brakes.

All Boilers Have "Jerrold" Patent Tube Setting in Top Head. They Absolutely Cannot Leak.

Every Engine has winch head on the end of each drum shaft for hauling the machine, piles, timber, etc. When used for operating a boom derrick, one drum is used for raising the load, and the other for raising or lowering the boom. When pile-driving, one drum is used for running the hammer and the other for hoisting the piles or timber. The ratchet and pawl on the end of the drum is a device for holding the weight with one drum while the boom is being lowered or swung to its desired position.

This Engine has been adopted by the United States Government Engineers, the largest contractors and iron bridge builders in the United States, and many railroad companies, as the best standard Hoisting Engine made.

In pile-driving a 6½x12 or 7¼x10 engine with a 2500 pound hammer will strike from 15 to 25 blows per minute, running the hammer from 12 to 25 feet high every blow; and with a 7x12 engine with a 3000 pound hammer will strike the same number of blows.



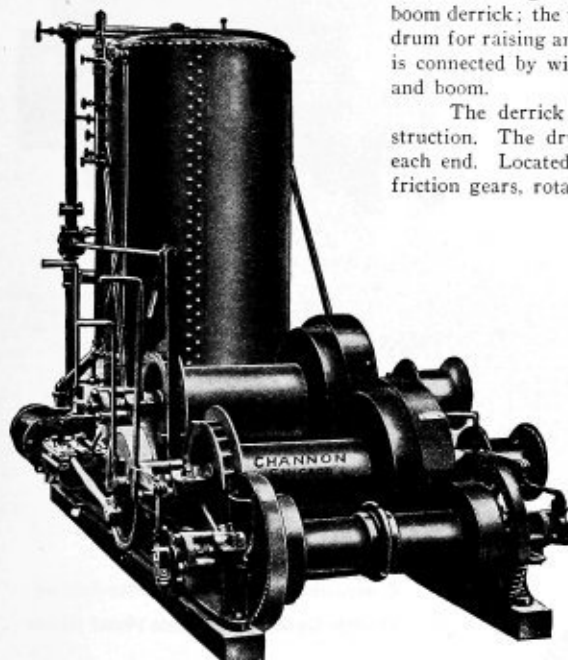
Size Number of Engine	Nominal Horse Power Rating	DIMENSIONS OF CYLINDERS		DIMENSIONS OF HOISTING DRUMS		Weight Hoisted Single Rope, Average Speed, Lbs.	Suitable Weight of Pile-driving Hammer for Very Quick Work, Lbs.	DIMENSIONS OF BOILERS				Estimated Shipping Weight with Boiler Complete, Lbs.	Price with Foot Brakes Complete
		Diameter Inches	Stroke Inches	Diameter Inches	Length Inches			Diameter Inches	Height Inches	No. Tubes 2-in. Diam.	Length of Tubes, Ins.		
227	8	4½	6	9	18	2000	800	28	68	40	42	4500	\$ 905.00
228	10	5	8	10	20	2500	1200	32	80	55	52	5600	1034.00
230	12	5½	10	12	20	3000	2000	34	84	60	56	7500	1140.00
232	16	6½	10	14	22	4000	2400	36	84	65	56	8200	1244.00
234	20	6¾	12	14	24	5000	2600	38	90	77	62	8800	1347.00
236	22	7¼	10	14	26	6500	2800	40	90	85	62	10200	1400.00
238	24	7	12	14	28	7000	3000	42	96	90	68	10600	1500.00
240	28	7½	12	14	30	7800	3400	42	96	90	68	11700	1575.00
242	32	8	12	16	30	8500	3800	44	102	104	74	13500	1657.00
244	40	9	10	16	30	9500	4000	46	102	125	74	14400	1782.00
246	42	8¾	13	16	30	10500	4200	46	102	125	74	15000	1907.00
248	45	9	13	16	30	11000	5000	48	102	142	74	16000	2060.00
250	50	9	16	18	30	12000	5500	48	102	142	74	16800	2260.00
252	55	10	13	18	30	13000	6000	50	102	155	74	19900	2492.00
254	60	10	16	18	32	14000	6500	52	108	160	78	22200	2675.00
256	70	11	18	20	32	17000	7000	54	108	185	78	27400	3084.00
258	80	12	16	22	40	19000	8000	60	120	200	90	32000	3450.00

Furnished with Link-Reversing Motion when especially ordered.

Can also be made with Clutched Winch Heads.

"MUNDY" IMPROVED DERRICK SWINGING ENGINE.

Double Cylinders, Double Patent Friction Drums with Ratchets and Pawls, Two Winch Heads and Wright's Patent Reversing Friction Swinging Drum, Boiler and all Fixtures Complete, Including Foot Brakes.



Can also be Furnished with Single Friction Drum.

This Engine is especially adapted for operating and swinging a boom derrick; the top drum being used for hoisting the load, the second drum for raising and lowering the boom, and the swinging drum, which is connected by wire rope to bull wheel of derrick, swings the mast and boom.

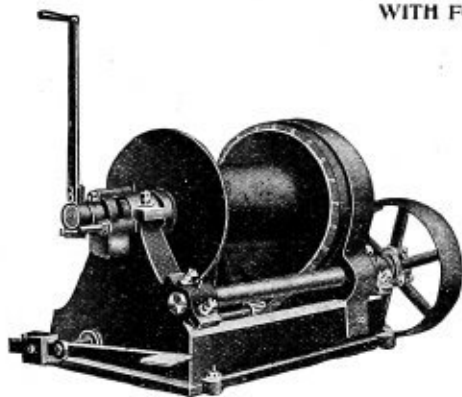
The derrick swinging attachment is of new design and construction. The drum works free on the shaft, and has a friction at each end. Located on the same shaft, at each end of the drum, are friction gears, rotating in opposite directions. The drum is arranged with an adjustment in the center for lengthening it to compensate for the wear of the frictions. The construction for operating the drum is so arranged that it is engaged with either friction by the movement of one lever. The drum, when at rest, is disengaged from both frictions, and for swinging the derrick is thrown in to either the forward or back motion friction, as may be required. The pulling speed of this drum is of a proportion approximating 1-5 to 1-6 of the speed of the hoisting rope, for swinging the derrick with the load and has an increased proportion of approximately one-third the speed of the pulling drums for returning the empty derrick, thus making a saving of time. All of the parts of this attachment are made extra heavy and strong with steel gearing, and being compound geared will swing a derrick under any circumstances.

Size Number of Engine	Horse Power Usually Rated	DIMENSIONS OF CYLINDERS		DIMENSIONS OF HOISTING DRUMS		Weight Hoisted, Single Rope, Average Speed, Lbs.	Suitable Weight of Pile-driving Hammer for Quick Work, Lbs.	DIMENSIONS OF BOILERS				Estimated Shipping Weight with Boiler Complete, Lbs.
		Diameter Inches	Stroke Inches	Diameter Inches	Length Inches			Diameter, Inches	Height Inches	No. Tubes 2-in. Diam.	Length of Tubes, Ins.	
521	10	5	8	10	20	2500	1200	32	80	55	52	6400
523	12	5½	10	12	20	3000	2000	34	84	60	56	8400
525	16	6½	10	14	22	4000	2400	36	84	65	58	9500
527	20	6¾	12	14	24	5000	2600	38	90	77	62	10400
529	22	7¼	10	14	26	6500	2800	40	90	85	62	11400
531	24	7½	12	14	28	7000	3000	42	96	90	68	11800
533	28	7¾	12	14	30	7800	3400	42	96	90	68	12900
535	32	8	12	16	30	8500	3800	44	102	104	74	15200
537	40	9	10	16	30	9500	4000	46	102	125	74	16100
539	42	8½	13	16	30	10500	4200	46	102	125	74	16800
541	45	9	13	16	30	11000	5000	48	102	142	74	17900
543	50	9	16	18	30	12000	5000	48	102	142	74	18800

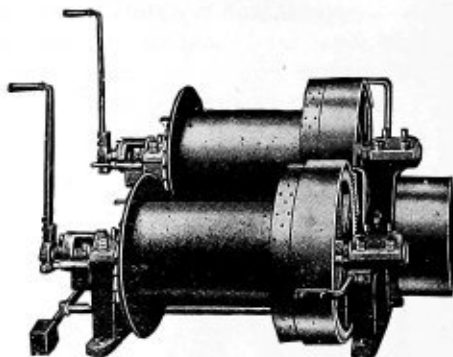
We can furnish this swinging attachment, including extension of frame with splice plate to attach same properly to frame of any make of engine.

"MUNDY" FRICTION DRUM BELT HOISTS

WITH FOOT BRAKES



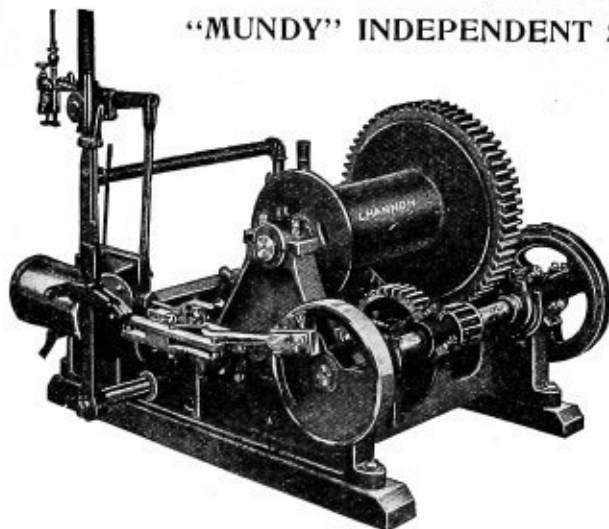
Single Drum



Double Drum

Can be belted to any power. Adapted for derricks, pulling cars, concrete and other miscellaneous hoisting.

Single Drum Hoist			Double Drum Hoist			SIZE OF DRUM		PROPORTION OF GEARING		SIZE OF PULLEY		Weight Drum Will Hoist with Single Rope Lbs.
No. of Hoist	Shipping Weight in Lbs.	Price	No. of Hoist	Shipping Weight in Lbs.	Price	Diam. In.	Length Inches	Teeth in Pinion	Teeth in Gear	Diam. In.	Face, In.	
1,025	900	\$105.00	1,035½	1,800	\$ 220.00	8	16	14	57	16	6	1,000
1,026	1,200	135.00	1,036	2,200	292.00	10	20	14	60	20	6	2,000
1,027	2,000	202.00	1,037	3,000	417.00	12	22	15	64	22	6	2,500
1,028	2,600	320.00	1,038	3,500	500.00	14	24	16	64	24	6	4,000
1,030	2,600	335.00	1,040	4,200	567.00	14	26	13	62	26	8	5,000
1,032	3,200	440.00	1,042	5,000	667.00	16	30	12	57	30	8	6,500
1,034	4,000	515.00	1,044	6,400	850.00	16	30	12	53	36	10	8,000
1,035	6,000	700.00	1,045	8,000	1,010.00	18	30	13	66	40	12	10,000



"MUNDY" INDEPENDENT SWINGING ENGINES

Compound-Geared, Link-Reversing
Double Cylinders, Single Fixed Drum

Operated entirely by one lever.

One of the crank discs has band brake, which locks when engine is at rest and releases when engine is started.

Especially adapted for swinging on dredges, barges, derricks, pile drivers, etc., where extra long and heavy booms are used, or any place where the mast is liable to get out of plumb, causing the machine to list, as on barge derricks.

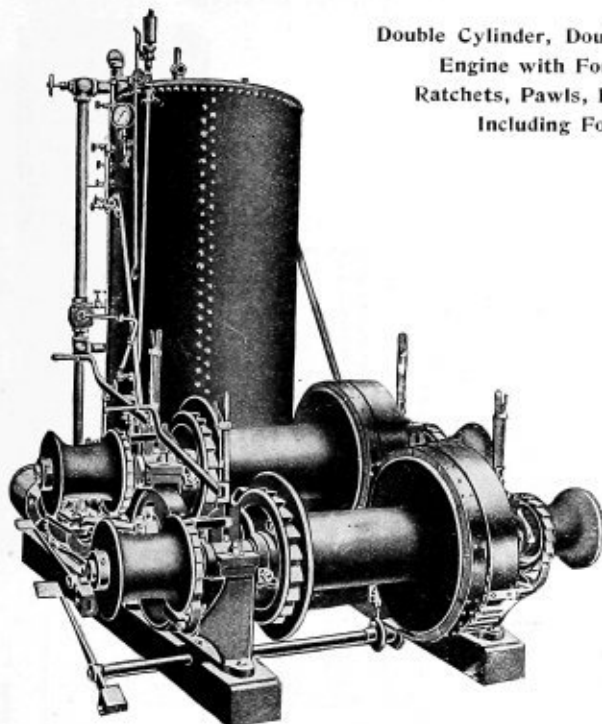
It is simple and compact in construction, taking up but little space, and made especially strong to stand the heavy strains due to dredge work, etc.

No.	CYLINDERS		DRUM		Ratio of Gearing	Approximate Shipping Weight	List Price
	Diam.	Stroke	Diam.	Length			
45x	4½	x 6	9	x 12	11 to 1	1,950 lbs.	\$500.00
50x	5	x 8	12	x 18	11.6 to 1	2,900 "	625.00
55x	6¼	x 10	12	x 24	10.9 to 1	4,300 "	900.00

"MUNDY" BRIDGE-BUILDERS' AND ERECTORS' ENGINE

With Four Independent Clutch Spools

Double Cylinder, Double Patent Friction Drum Hoisting Engine with Four Independent Clutch Spools, Ratchets, Pawls, Boiler and all Fixtures Complete. Including Foot Brakes for Each Drum.



This engine is the favorite type for bridge building, erecting, pile driving and contractor's use.

This engine is especially constructed as a combination engine for use where it is desirable to handle derricks with friction drums and other material by use of winches with free end lines. All winches are independent, working free on shafts and are engaged with clutches, also having ratchets and pawls.

The levers for operating the clutches are provided with racks and latches for holding the clutches in position when engaged with the winches or disengaged. The shafts are made extra large to withstand heavy strains.

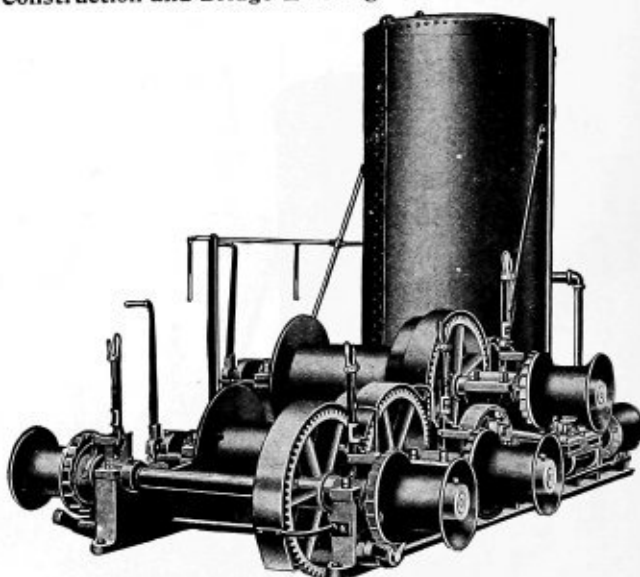
Size Number of Engine	Horse Power Usually Rated	DIMENSIONS OF CYLINDERS		DIMENSIONS OF HOISTING DRUMS		Weight Hoisted Single Rope Average Speed, Lbs.	Suitable Weight of Pile-driving Hammer for Quick Work, Lbs.	DIMENSIONS OF BOILERS				Estimated Shipping Weight with Boiler Complete, Lbs.
		Diameter Inches	Stroke, Inches	Diameter Inches	Length, Inches			Diameter Inches	Height, Inches	Number of Tubes 2-Inch Diameter	Length of Tubes, Inches	
416	10	5	8	10	20	2500	1200	32	80	55	52	6000
418	12	5½	10	12	20	3000	2000	34	84	60	56	8300
420	16	6¼	10	14	22	4000	2400	36	84	65	56	9500
422	20	6½	12	14	24	5000	2600	38	90	77	62	10000
424	22	7¼	10	14	26	6500	2800	40	90	85	62	10900
426	24	7	12	14	28	7000	3000	42	96	90	68	11200
428	28	7½	12	14	30	7800	3400	42	96	90	68	12500
430	32	8	12	16	30	8500	3800	44	102	104	74	14500
432	40	9	10	16	30	9500	4000	46	102	125	74	15200
434	42	8½	13	16	30	10500	4200	46	102	125	74	15800
436	45	9	13	16	30	11000	5000	48	102	142	74	17000
438	50	9	16	18	30	12000	5000	48	102	142	74	17900
440	55	10	13	18	30	13000	5500	50	102	155	74	21400

No. 424 is the popular size.

"MUNDY" DOUBLE CYLINDER, DOUBLE FRICTION DRUM HOISTING ENGINE AND BOILER

With Extension Winch Shaft and Four Clutch Winches, Especially Adapted for Architectural Iron Work, Construction and Bridge Erecting

This engine is constructed especially for bridge erecting and structural work where a great amount of handling is done with winches and free end lines. Each winch works independently, with clutches and shifting apparatus; the frames being extended and provided with a very heavy shaft for hoisting or hauling of heavy loads. It is a very complete engine for general contracting work. All the drums and winches have shrouded ratchets, and are provided with pawls, for holding the load when the frictions or clutches are thrown out. The extension shaft with the frames can be made detachable if desired. Foot brakes included unless otherwise ordered.



SIZE NUMBER OF ENGINE.	Horse Power Usually Rated	DIMENSIONS				Weight Hoisted, Single Rope, Average Speed, Lbs.	Suitable Weight of Pile-driving Hammer for Quick work, Lbs.	DIMENSIONS OF BOILERS				Estimated shipping Wgt. with Boiler Complete, Lbs.
		Cylinders		Hoisting Drums				Diameter, Inches	Height, Inches	Number of Tubes 2-in. Diam.	Length of Tubes, Inches	
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches							
542	16	6½	10	14	22	4000	2400	36	84	65	56	9200
544	20	6½	12	14	24	5000	2600	38	90	77	62	10400
546	22	7½	10	14	26	6500	2800	40	90	85	62	12400
548	24	7	12	14	28	7000	3000	42	96	90	68	12700
550	28	7½	12	14	30	7800	3400	42	96	90	68	13750
552	32	8	12	16	30	8500	3800	44	102	104	74	15600
554	42	8½	13	16	30	10500	4200	46	102	125	74	16800
556	45	9	13	16	30	11000	5000	48	102	142	74	18000
558	50	9	16	18	30	12000	5000	48	102	142	74	20000
560	55	10	13	18	30	13000	5500	50	102	155	74	23000

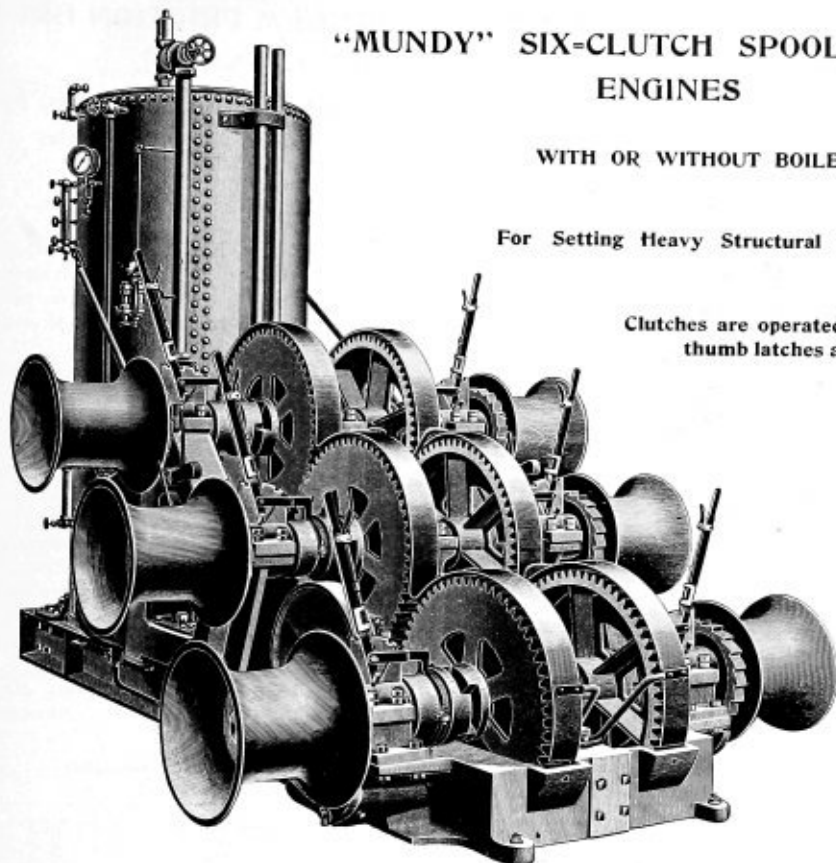
Propelling attachment for derrick car is usually attached to front shaft.

"MUNDY" SIX-CLUTCH SPOOL ERECTING ENGINES

WITH OR WITHOUT BOILER

For Setting Heavy Structural Work

Clutches are operated with hand levers,
thumb latches and quadrants



For handling and setting of material in bridge and structural work, this is a most complete machine, as any number of the winches can be operated at the same time and the work can be accurately lowered and set in place by permitting the line to slip on the winch when the winch is being held by the pawl and ratchet.

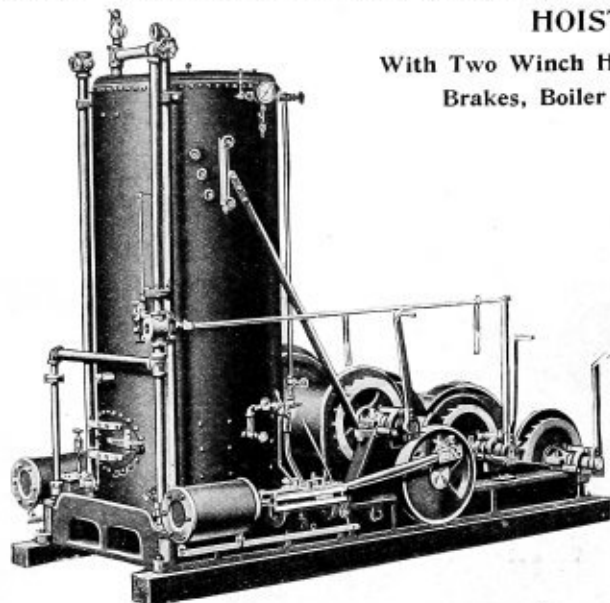
The spools or winches are very large and are provided with ratchets and pawls and keyed to the shaft; each shaft works independently and has a direct gear drive from the engine with a positive clutch working on the shaft and engaging with the gears, which run free on shaft.

Size Number with Six Spools.	Horsepower Usually Rated.	DIMENSIONS						Estimated Shipping Wt. with Boiler Complete, Lbs.
		CYLINDERS		BOILERS				
		Diameter, Inches.	Stroke, Inches.	Diameter, Inches.	Height, Inches.	No. of Tubes, 2 In. Diameter.	Length of Tubes, Inches.	
622	20	6½	12	38	90	77	62	14,800
624	22	7¼	10	40	90	85	62	15,200
626	24	7	12	42	96	90	68	15,700
628	28	7½	12	42	96	90	68	16,500
630	32	8	12	44	102	104	74	18,000
631	45	9	13	48	102	142	74	20,000
631½	55	10	13	50	102	155	74	26,000

Also made with 4 or 8 spools, as desired.

"MUNDY" DOUBLE CYLINDER, TRIPLE TANDEM FRICTION DRUM HOISTING ENGINE,

With Two Winch Heads, Ratchets and Pawls, Foot Brakes, Boiler and all Fixtures Complete.



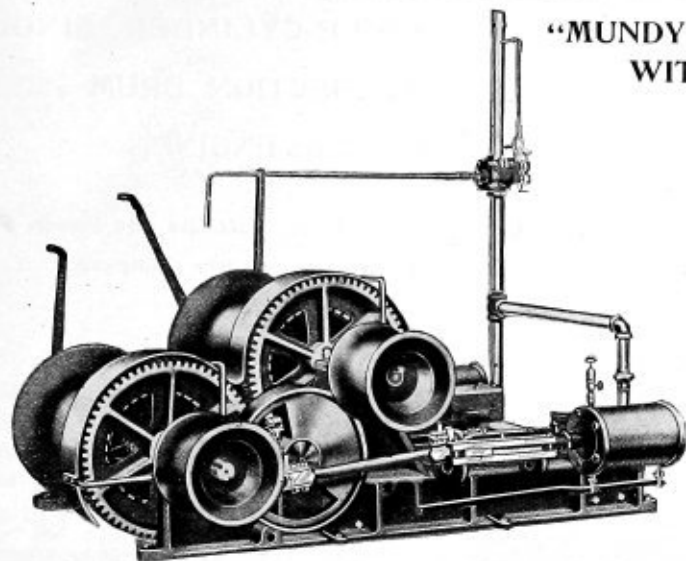
This engine is constructed with three friction drums, all provided with pawls and ratchets, each working independently. It is specially designed for operating a derrick, or handling a clamshell, or orange-peel bucket where it is desirable to use three lines; one drum being used to hoist and lower the boom, using the two remaining drums for operating the bucket. It can also be used for many other purposes where it is necessary to operate three hoisting lines.

There are two large winches fixed to the outer end of the drum shafts. We also furnish this engine with independent clutch winches in place of fixed winches, when wanted.

Also furnished with Wright's Patent Reversing Friction Swinging Drum, for swinging the derrick booms

SIZE NUMBER OF ENGINE	Horse Power Usually Rated	DIMENSIONS				Weight Hoisted, Single Rope, Average Speed, Lbs.	Suitable Weight of Pile-driving Hammer for Quick Work. Lbs.	DIMENSIONS OF BOILERS				Estimated Shipping Wgt. with Boiler Complete, Lbs.
		Cylinders		Hoisting Drums				Diameter, Inches	Height, Inches	Number of Tubes 2-in. Diam.	Length of Tubes, Inches	
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches							
442	10	5	8	10	20	2500	1200	32	80	55	52	6700
444	12	5½	10	12	20	3000	2000	34	84	60	56	9500
446	16	6¼	10	14	22	4000	2400	36	84	65	56	10000
448	20	6½	12	14	24	5000	2600	38	90	77	62	10800
450	22	7¼	10	14	26	6500	2800	40	90	85	62	11700
452	24	7	12	14	28	7000	3000	42	96	90	68	12600
454	28	7½	12	14	30	7800	3400	42	96	90	68	13800
456	32	8	12	16	30	8500	3800	44	102	104	74	15900
458	40	9	10	16	30	9500	4000	46	102	125	74	16200
460	42	8½	13	16	30	10500	4200	46	102	125	74	17800
462	45	9	13	16	50	11000	5000	48	102	142	74	18800
464	50	9	16	18	30	12000	5000	48	102	142	74	20000
466	55	10	13	18	30	13000	5500	50	102	155	74	23500
468	60	10	16	18	32	14000	6000	52	108	160	78	27000
470	70	11	18	20	32	17000	7000	54	108	185	78	30000
472	80	12	16	22	40	19000	8000	60	120	200	90	36000

"MUNDY" HOISTING ENGINE WITHOUT BOILER



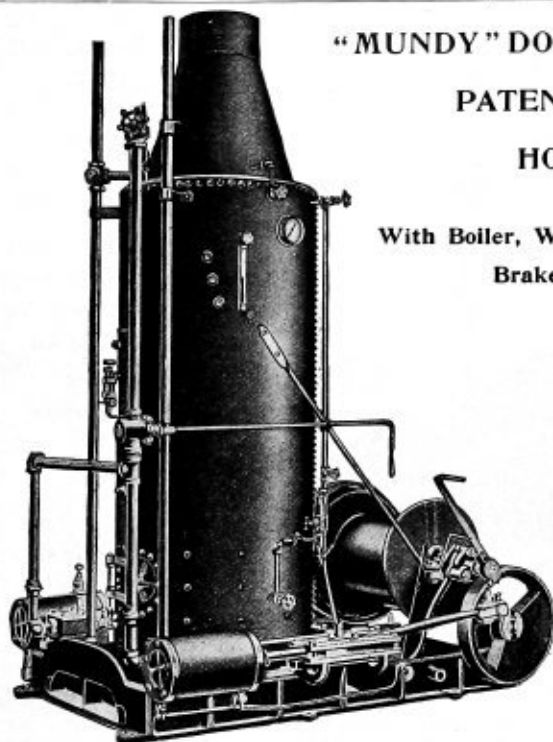
Double Cylinders, Double
Patent Friction Drums, with
Ratchets and Pawls, Two
Winch Heads and All
Fixtures Complete
Including Foot Brakes
For Each Drum

This type of engine is designed for operating derricks and for general hoisting purposes. It is especially adapted for use in quarries, or tunnel work, or excavations where it is desirable to use many of these engines along a line of work, taking the steam or compressed air from one stationary plant. All Mundy engines will work under compressed air pressure equally as well as under steam pressure. It is also well adapted for use on structural work, trestle work, and places where it is necessary to locate the engine at a point not convenient for the location of a boiler. This engine furnished with clutched winches in place of the fixed winches when desired. We always furnish foot brakes unless otherwise ordered.

SIZE NUMBER OF ENGINES	Horse Power Usually Rated	DIMENSIONS OF CYLINDERS		DIMENSIONS OF HOISTING DRUMS		Weight Hoisted Single Rope, Average Speed, Lbs	Suitable Weight of Pile-driving Hammer for Quick Work, Lbs.	Estimated Shipping Weight, Lbs.
		Diameter, Inches	Stroke, Inches	Diameter Inches	Length, Inches			
379	8	4½	6	9	18	2000	800	2600
380	10	5	8	10	20	2500	1200	3400
382	12	5½	10	12	20	3000	2000	4800
384	16	6½	10	14	22	4000	2400	5100
386	20	6¾	12	14	24	5000	2600	5400
388	22	7¼	10	14	26	6500	2800	6500
390	24	7	12	14	28	7000	3000	7000
392	28	7½	12	14	30	7800	3400	7600
394	32	8	12	16	30	8500	3800	8400
396	40	9	10	16	30	9500	4000	8800
398	42	8½	13	16	30	10500	4200	10000
400	45	9	13	16	30	11000	5000	11500
402	50	9	16	18	30	12000	5000	12400
404	55	10	13	18	30	13000	5500	14000
406	60	10	16	18	32	14000	6000	17200
408	70	11	18	20	32	17000	7000	24700
410	80	12	16	22	40	19000	8000	26500
412	100	12	20	24	40	24000	.....	30000
413	125	14	30	26	48	32000	.....	34000
414	130	14	24	26	48	35000	.....	36000

“MUNDY” DOUBLE CYLINDER, SINGLE PATENT FRICTION DRUM HOISTING ENGINE,

**With Boiler, Winch Head, Ratchets and Pawls, Foot
Brakes and all Fixtures Complete**

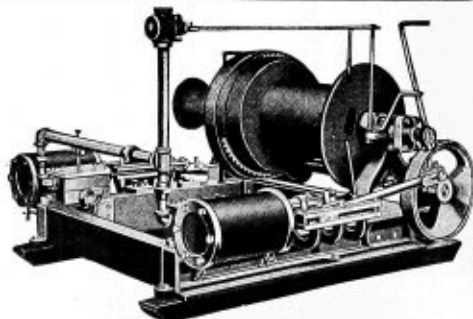


This engine is used where but one hoisting line is required. It is fitted with either a fixed or clutched winch on the drum shaft, so that a second line can be used for hoisting piles or any other material.

As a pile-driving engine, where an engine of light weight is required, it is very convenient. It is also well adapted for the use of unloading and loading of ship's cargo and for general hoisting purposes.

SIZE NUMBER OF ENGINE	Horse Power Usually Rated	DIMENSIONS				Weight Hoisted, Single Rope, Average Speed, Lbs.	Suitable Weight of pile-driving Hammer for Quick Work, Lbs.	DIMENSIONS OF BOILERS				Estimated Ship- ping Wgt., with Boiler Complete, Lbs.
		Cylinders		Hoisting Drum				Diameter, Inches	Height, Inches	No. of Tubes 2-in Diam.	Length of Tubes, Inches	
		Diam., Inches	Stroke, Inches	Diam., Inches	Length, Inches							
191	8	4¾	6	9	18	2000	800	28	68	40	42	3500
192	10	5	8	10	20	2500	1200	32	80	55	52	4500
194	12	5½	10	12	22	3000	2000	34	84	60	56	5900
196	15	6¼	12	14	24	4000	2400	36	84	65	56	6500
198	20	6½	12	14	24	5000	2600	38	90	77	62	7300
200	22	7¼	10	14	26	6500	2800	40	90	85	62	7800
202	24	7	12	14	28	7000	3000	42	96	90	68	8500
204	28	7½	12	14	30	7800	3400	42	96	90	68	9800
206	32	8	12	16	30	8500	3800	44	102	104	74	10700
208	40	9	10	16	30	9500	4000	46	102	125	74	11500

**Mundy Double Cylinder Single
Patent Friction Drum Engine
Without Boiler
Made same sizes as above**

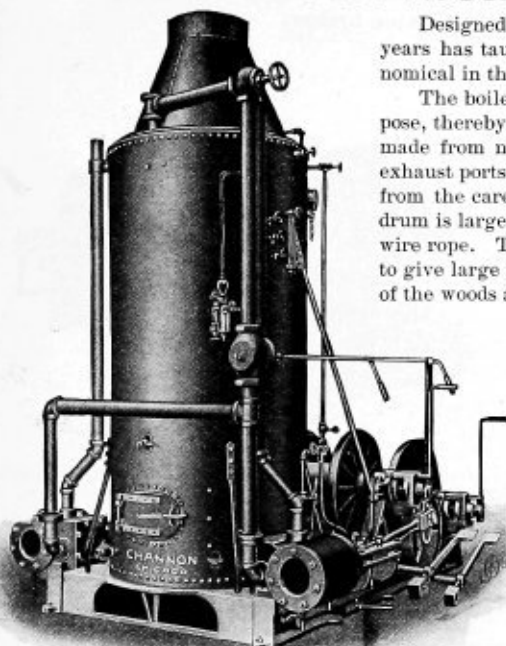


MUNDY LOGGING ENGINES

Designed especially for logging purposes. Experience of many years has taught that these machines are the best and most economical in the long run.

The boilers are extra large on all Mundy Engines for this purpose, thereby steaming freely with a wood fire. The engines are made from new patterns throughout, with extra large steam and exhaust ports, thereby quickly giving the largest amount of power from the carefully selected sizes of the cylinders. The lower hoist drum is larger than the upper one and will hold a large amount of wire rope. The spur gear is also much larger. This is designed to give large pulling power from this drum for hauling the log out of the woods at a slow speed, while the engines are in quick revolution. The upper drum being geared quicker winds a large amount of smaller wire rope for the purpose of hauling the pulling rope back in the woods to the starting point.

The bed frames are extra strong. All parts of the engine fitted in the best possible manner. Drum and crank shafts made of steel. The gearing is made from cut patterns. The lower drum is so arranged when ordered that it can be detached from the frame, thereby making a single-drum engine. This is done by bolting underneath the bed frame heavy wrought-iron fish plates



Mundy Steel Logging Engine Nos. 706, 708 and 710

Size Number	Horse Power	CYLINDERS		DIAMETER OF		DIAMETER OF		Length of Drum Between Flanges, Inches	Diameter of Boiler in Inches	Height of Boiler in Inches	Number of 2-inch Tubes	Length of Tubes in Inches	Estimated Wt. of Engine and Boiler, Lbs.
		Bore in Inches	Stroke in Inches	Upper Drum in Inches	Flanges in Inches	Lower Drum in Inches	Flanges in Inches						
698	28	7½	12	12	30	14	40	30	44	102	104	74	11200
700	42	8½	13	14	30	16	40	32	48	102	142	74	15700
702	45	9	13	14	30	16	40	32	48	102	142	74	16800
704	60	10	13	16	32	18	44	38	52	108	160	78	20500

Mundy Steel Logging Engines

Especially adapted for hauling and yarding purposes. The bed frame, main pulling gear and winding drum are made of open-hearth steel.

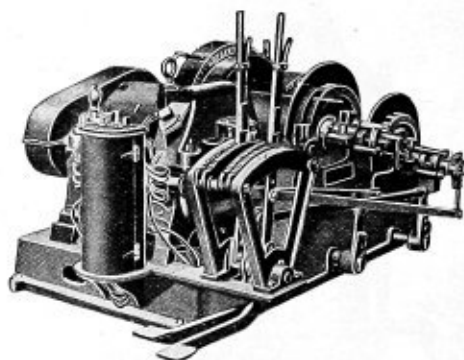
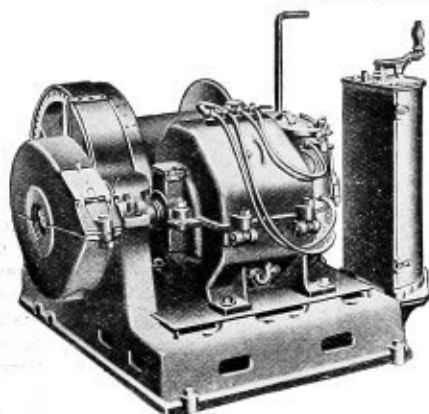
The engines are very strong and capable of making long, heavy hauls. All parts of these machines are built in the best proportion, while the workmanship and material are first-class and have been pronounced by many who are using them on the Pacific Coast to be indestructible.

The boilers are made especially to carry high steam pressure, and the engine can be run at a high rate of speed, thereby producing great amount of horse-power.

Size Number of Engine	Horse Power Usually Rated 100 lbs. Pressure	DIMENSIONS				DIMENSIONS OF BOILERS				Estimated Shipping Wgt. with Boiler Complete. Lbs.
		Cylinders		Hoisting Drums		Diameter, Inches	Height, Inches	Number of Tubes 2-inch Diam.	Length of Tubes, Inches	
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches					
706	60	7¼	10	12	30	44	102	104	74	14000
708	90	9	10	12	34	48	102	142	74	16180
710	145	10	13	12	48	54	108	185	78	23000

"MUNDY" FRICTION DRUM ELECTRIC HOISTS

With Patent Automatic Locking Brakes



The above illustrations show designs as generally furnished. We can arrange position of motors, drums and controllers to suit convenience of purchaser. Controllers of the street car pattern are furnished so that any speed may be obtained from minimum to maximum as quickly as with a steam hoist.

Our line of Electric Hoists is very complete, consisting of Single Friction Drum, Double and Triple Friction Drum with winches, the best arranged handling apparatus together with the most reliable electrical apparatus that is constructed. We also furnish special types of Electrical Machinery such as Haulage Machines, Continuous Winding Machines, etc. In ordering it is necessary to state all the electrical conditions under which the hoist will be used, also give speed that the load is to be hoisted per minute when motor is running at its full speed.

SINGLE DRUM HOIST

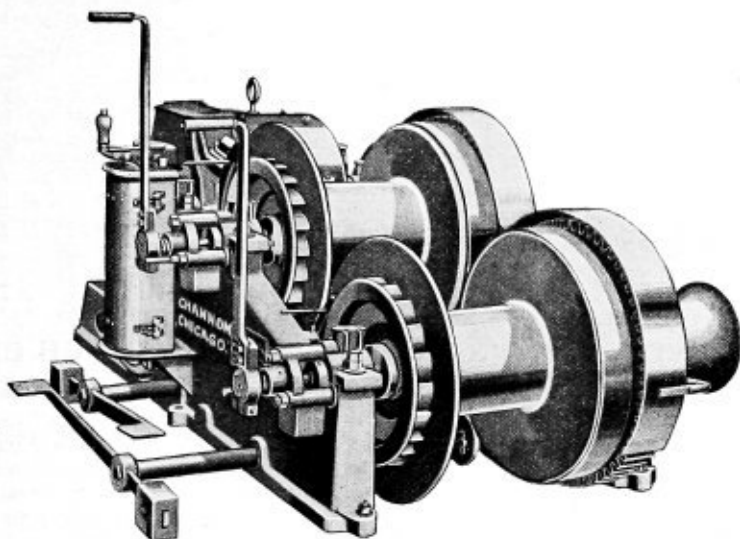
NUMBER OF HOIST	Motor Horse Power	SIZE OF DRUM		HOISTING DUTY		Estimated Shipping Weight, Lbs.
		Diameter, Inches	Length, Inches	Weight Hoisted, Lbs.	Speed in Feet per Minute	
1054	10	10	16	1500	200	3500
1056	15	12	16	2000	225	4000
1058	20	14	18	2800	225	4500
1060	25	14	18	3500	225	5000
1062	30	16	18	4200	225	5500
1064	35	16	18	4800	225	6000
1066	40	18	18	5500	225	6500
1068	45	20	20	6200	225	7000
1070	50	22	20	7700	225	8000

DOUBLE DRUM HOIST

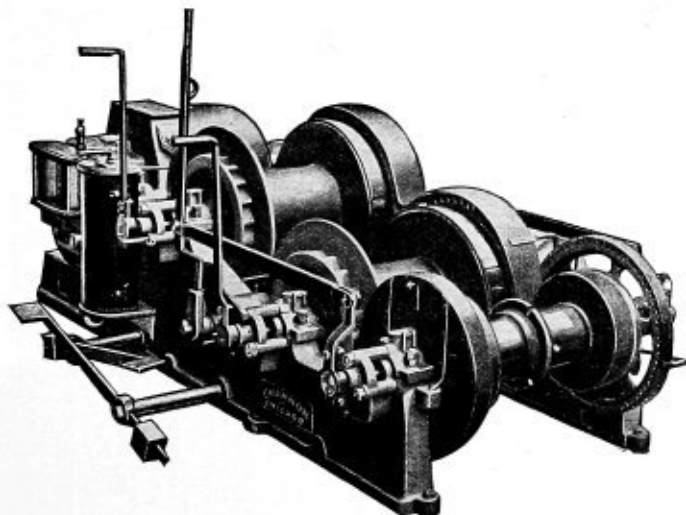
NUMBER OF HOIST	Motor Horse Power	SIZE OF DRUMS		HOISTING DUTY		Estimated shipping Weight, Lbs.
		Diameter, Inches	Length, Inches	Weight Hoisted, Lbs.	Speed in Feet per Minute	
1072	10	9 and 10	16	1500	200	4200
1074	15	10 " 12	16	2000	225	4800
1076	20	12 " 14	18	2800	225	5300
1078	25	12 " 14	18	3500	225	6000
1080	30	14 " 16	18	4200	225	6700
1082	35	14 " 16	18	4800	225	7200
1084	40	16 " 18	18	5500	225	7800
1086	45	16 " 20	20	6200	225	8500
1088	50	18 " 22	20	7000	225	10000

Be sure to state your Current and Voltage, also Maximum Load and Speed that the Hoist is to handle

MUNDY ELECTRIC HOISTS



Standard Double Friction Drum Hoist



Standard Double Friction Drum, Contractors Electric Hoist, with Wright's Patent Single Reversing Drum Derrick Swinging Attachment

FOR SIZES, ETC., SEE OPPOSITE PAGE

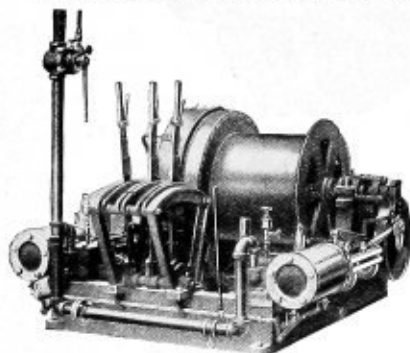


"MUNDY" DOUBLE CYLINDER SINGLE FRICTION DRUM MINING AND QUARRY ENGINE WITHOUT BOILER

Has large gearing, large friction and drum for rapid hoisting. Drum is true and well balanced, either plain or grooved for rope. Drum is also provided with band brake, operated by foot lever.

Size No. of Engine	Horse- power Usual- ly Rated	DIMENSIONS				Weight Hoisted, Single Rope, Average Speed, Lbs.	Estimated Shipping Weight, Lbs.
		Cylinders		Hoisting Drum			
		Diam., Inches	Stroke, Inches	Diam., Inches	Length Inches		
794	16	6½	10	24	22	2700	4410
796	20	6½	12	26	24	3300	4800
798	22	7½	10	28	26	3700	5100
800	24	7	12	28	28	3900	5300
802	28	7½	12	30	30	4100	5600
804	32	8	12	30	30	4500	6000
806	42	8½	13	32	30	5000	7500
808	50	9	16	34	32	5500	9000
810	60	10	16	36	36	7700	11300

DOUBLE CYLINDER MINE HOISTING OR HAULAGE ENGINE



This is a combination engine, constructed with link-reversing motion, double cylinders and friction drum. It is especially adapted for hoisting from mines of different levels, also for hauling trains of cars from mines being worked with incline plain, or on a level. The drum is grooved for the rope or made with plain body and also provided with a powerful band brake, and is made to carry a large amount of rope. The link-reversing apparatus, thrust apparatus and brake are all banked in quadrant with racks and latch levers at front of engine.

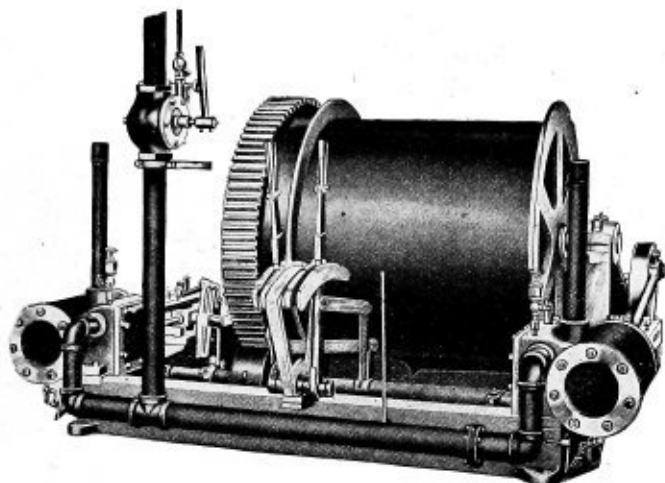
The engine is of the very best construction, made strong and durable and a load can be hoisted or hauled at a rapid speed. For hoisting from a shaft two ropes can be used on the drum, thus handling two cages, one cage being lowered while the other is being hoisted from the mine.

Size Number of Engine	Horse-Power Usually Rated	DIMENSIONS				Speed will Hoist in Feet per Minute	Weight Hoisted, Single Rope, Average Speed, in Lbs.	Estimated Shipping Weight
		Cylinders		Hoisting Drums				
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches			
645	22	7 $\frac{1}{4}$	10	28	30	450	2500	5800
647	24	7	12	28	30	450	2800	6000
649	28	7 $\frac{1}{2}$	12	30	36	450	3000	6500
651	32	8	12	40	36	500	3500	7800
653	40	9	10	42	40	525	3700	8500
655	42	8 $\frac{1}{2}$	13	42	40	525	4000	9500
657	45	9	13	48	42	550	4200	10500
659	50	9	16	48	42	550	4500	12000
661	55	10	13	54	48	600	4500	13300
663	60	10	16	54	48	600	5000	14000
665	70	11	18	56	54	600	5500	16500
667	80	12	16	60	54	600	6000	18400
669	100	12	20	60	60	600	6500	20000
671	130	14	20	66	60	600	7000	28000

"MUNDY" DOUBLE CYLINDER SINGLE DRUM MINE HOISTING ENGINE

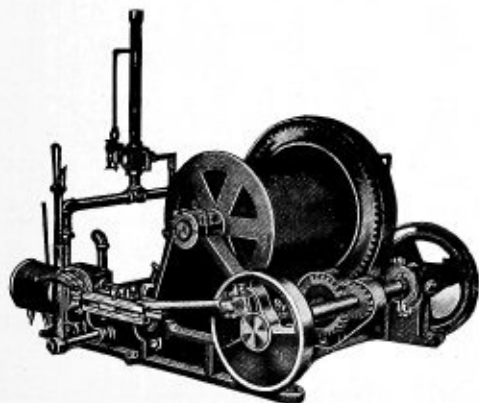
This engine is especially designed and constructed for rapid hoisting and is well adapted to mine hoisting or haulage. It is constructed with direct gears, with the drum fixed to the gear and keyed to the shaft and is arranged with link-reversing motion. It also has a powerful wood-lined band brake, with a compound lever connection, which gives the operator a great purchase in holding the load with the brake. Both levers for operating the brake and the link-reversing motion are banked in a quadrant and the links are thoroughly balanced and can be handled very quickly and easily. The throttle valve is balanced and of the very best construction. The driving pinion on the engine shaft is made of cast steel and all parts of the engine are made very strong and heavy.

This is an excellent mine hoisting engine and can also be used for any other purpose where rapid haulage or hoisting is required.



Can furnish other sizes than listed if wanted

Size Number of Engine	Horse Power Usually Rated	DIMENSIONS OF CYLINDERS		DIMENSIONS OF HOISTING DRUM		Weight Will Start in Lbs.	Speed Will Hoist in Feet per Minute	Estimated Shipping Wgt., Lbs.
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches			
812	50	9	16	48	46	4500	600	11055
815	60	10	13	54	46	5000	625	14000
816	70	11	18	56	56	5600	785	15000
819	100	12	16	62	60	6700	925	18000
821	130	14	20	64	66	9800	975	24000



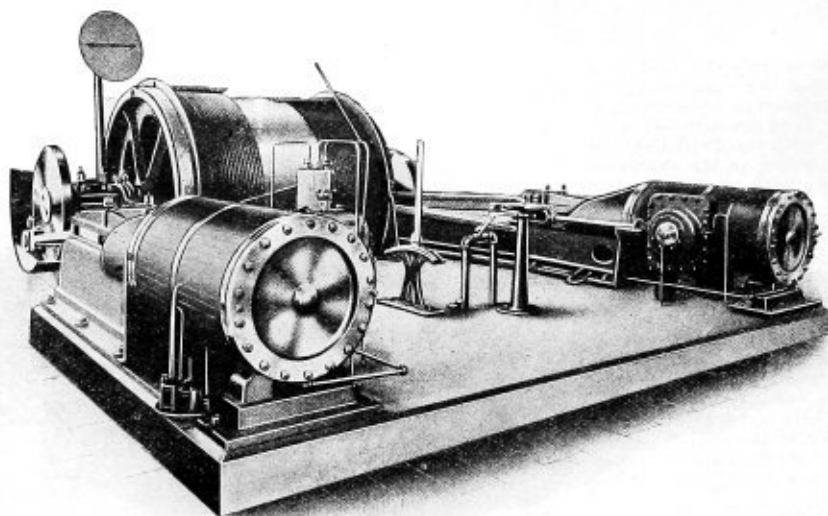
Mundy Double Cylinder Compound Geared Single Drum Hoisting Engine, with or without Link-Reversing Motion

Largely used for heavy hoisting on railroad coal inclines, etc.

Made all Sizes. 10 Horse Power and Larger

PRICES QUOTED UPON REQUEST

FIRST MOTION HIGH SPEED HOISTING ENGINE



Made with any Style of Drum

Proper maximum load for twin connected first motion hoisting engines. Figured on the basis of the full strength of one engine in middle of stroke with 60 lb. M. E. P.

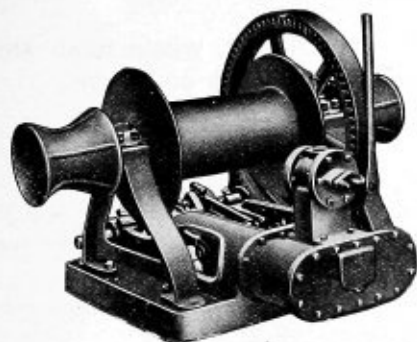
Pull on rope due to a load of one ton (2,000 lbs.) on slopes up to 45°.

SIZE	5 ft. Drum	6 ft. Drum	7 ft. Drum	8 ft. Drum	9 ft. Drum	10 ft. Drum	11 ft. Drum	Angle in degrees	Corresponding elevation in 100 feet of per cent slope	Pull due to one ton with 40 lbs. allowance for friction	Angle in degrees	Corresponding elevation in 100 feet of per cent slope	Pull due to one ton with 40 lbs. allowance for friction
14x24	3600	3000	2571	2250	2000	1800	1636	1	1.7	75	24	44.5	853
14x28	4200	3500	3000	2625	2333	2100	1909	2	3.5	110	25	46.6	885
16x18	3600	3000	2571	2250	2000	1800	1636	3	5.2	145	26	48.8	917
16x24	4800	4000	3428	3000	2666	2400	2181	4	7.0	180	27	51.0	948
16x30	6000	5000	4285	3750	3333	3000	2729	5	8.7	214	28	53.2	979
16x32	6400	5333	4571	4000	3555	3200	2909	6	10.5	249	29	55.4	1010
18x30	7500	6250	5343	4689	4166	3750	3410	7	12.3	284	30	57.7	1040
18x32	8000	6666	5714	5000	4444	4000	3636	8	14.1	318	31	60.1	1070
18x36	9000	7500	6428	5625	5000	4500	4000	9	15.8	353	32	62.5	1100
18x40	10000	8333	7142	6250	5555	5000	4545	10	17.6	387	33	64.9	1129
20x26	8165	6803	5832	5102	4535	4082	3711	11	19.4	422	34	67.5	1158
20x32	9920	8266	7085	6200	5511	4960	4509	12	21.3	456	35	70.0	1187
20x36	11160	9300	7971	6975	6200	5580	5072	13	23.1	490	36	72.7	1216
20x40	12400	10333	8856	7750	6888	6200	5635	14	24.9	524	37	75.4	1244
20x42	13188	10990	9420	8242	7326	6594	5994	15	26.8	558	38	78.1	1271
22x36	13680	11400	9771	8550	7600	6840	6218	16	28.7	591	39	81.0	1299
22x40	15200	12667	10856	9500	8440	7600	6908	17	30.6	625	40	83.9	1326
22x42	15960	13300	11400	9925	8866	7980	7254	18	32.5	658	41	86.9	1352
24x36	16200	13500	11571	10125	9000	8100	7363	19	34.4	691	42	90.0	1378
24x40	18000	15000	12857	11250	10000	9000	8181	20	36.4	724	43	93.3	1404
24x42	18985	15820	13560	11865	10546	9492	8630	21	38.4	757	44	96.6	1429
24x44	19800	16500	14143	12375	11000	9900	9000	22	40.4	789	45	100.0	1454
24x48	21600	18000	15428	13500	12000	10800	9818						
26x40	21300	17417	14929	13062	11611	10450	9500						
26x42	22050	18374	15750	12787	12250	11025	10022						
26x48	25440	21200	18171	15900	14133	12720	12473						
30x42	29400	24500	21000	18375	16333	14700	13363						
30x48	33600	28000	24000	21000	18667	16800	15272						
30x60	42360	35300	30257	26475	23533	21180	19250						
34x48	43200	36000	30857	27000	24000	21600	19636						
34x54	48810	40675	34893	30506	27116	24405	22186						
34x60	54420	45350	38871	34012	30233	27210	24736						

NOTE.—100 lbs. per ton of rope should be allowed for friction of rollers, drag, etc., in addition to allowance for rope as per table.

Specifications, Blue Prints and Prices upon Request

"JACKSON" DOUBLE CYLINDER, REVERSIBLE, SINGLE GEARED DRUM HOISTING ENGINES



View of Engine, showing two Winch Heads. Can be furnished with one Winch or without as desired. Size of Winches, 8 x 12 inches.

For Steam or Compressed Air

These Hoists are quick, simple, compact and powerful. They are under complete control of the throttle. Can be stopped, started or reversed instantly, and will hold load without brake.

Adapted for mines, coal and ore docks, for pulling cars and general hoisting purposes. Before leaving the shop, every Hoist is tested and run under pressure, and all working parts thoroughly inspected and adjusted. Being double-cylindere, the speed is uniform, and there are no dead centers; they, therefore, have a high lifting power as well as steady and uniform motion. The gears are protected by a wrought band to keep lines and clothing from being drawn in.

No.	Usually Rated H. P.	CYLINDERS		Will Hoist Single Line, Lbs.	SIZE OF GEARS		Size of Drum, Inches	Floor Space, Inches	Weight, Lbs.	Price
		Diameter	Stroke		Pinion	Gear				
66	12	6	7	2500	7	34½	12 x 20	68 x 52	2500	\$390.00
67	18	7	8	3000	7	34½	12 x 20	70 x 60	2700	425.00
68	26	8	9	4000	7	42	12 x 20	72 x 60	4200	520.00

Price includes Throttle Valve, Oil Cups, Sight Feed Cylinder Lubricator and two Winches. If Winches are not wanted, deduct \$7.50 each net. Hoist will lift 1000 lbs. more on Winch Head than on Drum (given above).

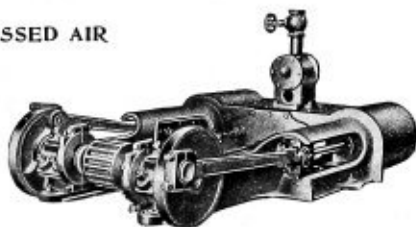
"JACKSON" DOUBLE CYLINDER REVERSIBLE CENTER-GEAR ENGINES

FOR STEAM OR COMPRESSED AIR

These engines are completely under control with throttle, and can be stopped, started or reversed instantly.

Crank shaft, connecting rods, piston and valve rods are steel; cross head gibs are babbitted, and boxes in connecting rods are of gun metal. All bearings are adjustable to wear, and of high grade anti-friction metal, to insure smooth running.

They are used successfully on dredges for hoisting dippers, swinging cranes and hoisting spuds; in saw mills for circular feeds; in iron-working shops for driving punches, shears and rolls; for driving concrete mixers, etc.

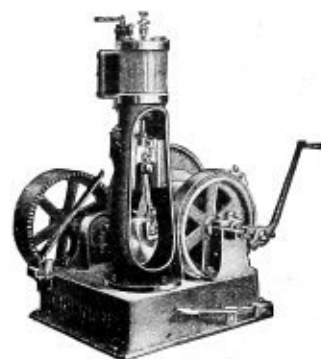


No. of Engine	Horse Power Usually Rated	SIZE OF CYLINDERS		Floor Space Required	Shipping Weight	Price, Each
		Diameter	Stroke			
36½	12 Horse Power	6 inches	8 inches	36x62 inches	1300 Pounds	\$320.00
37	18 " "	7 " "	9 " "	48x68 " "	1600 " "	360.00
38	28 " "	8 " "	10 " "	48x70 " "	2000 " "	480.00
310	40 " "	10 " "	12 " "	62x88 " "	4200 " "	700.00
310½	45 " "	10 " "	14 " "	62x92 " "	4400 " "	815.00

Can Also be Furnished with Side Instead of Center Gears

Prices Include Throttle Valve, Oil Cups and Sight Feed Cylinder Lubricator

"ECLIPSE" VERTICAL, SINGLE CYLINDER SINGLE FRICTION DRUM, HOISTING MACHINE



WITH "THROWING-OFF" ATTACHMENT, WINCH HEAD AND
FOOT BRAKES AND ALL FIXTURES COMPLETE

Adapted for general hoisting, within its capacity, for pulling cars, mine prospecting, etc.

Particular attention is called to the device for throwing the crank off the "dead-center." By the use of this contrivance the operator need not leave his position to start the engine.

Hoisting capacity given below is at the rate of 100 feet per minute.

No.	Usually Rated	Size of Cylinder	Hoisting Capacity	SIZE DRUM		Diameter of Flanges	SIZE BAND WHEEL		Weight	Price
				Diameter	Length		Diameter	Face		
22	7 H. P.	6 x 6	1000 lbs.	14	12	21 in.	24 in.	6 in.	1800 lbs.	\$350.00
23	10 H. P.	7 x 7	1500 lbs.	20	12	27 in.	28 in.	7 in.	2700 lbs.	460.00
24	14 H. P.	8 x 8	2000 lbs.	28	14	36 in.	32 in.	7 in.	4000 lbs.	550.00

CLASS B, VERTICAL, SINGLE CY- LINDER, SINGLE FRICTION DRUM, HOISTING ENGINE WITH BOILER, COMPLETE AND MOUNTED ON TRUCKS

This is a light, portable outfit which may be used for general hoisting.

Furnished with Foot Brake, also Winch Head.

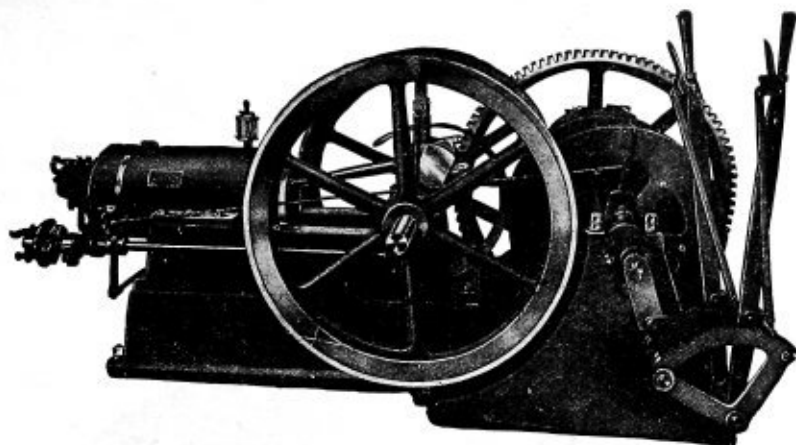
Will handle pile hammers of 500, 800 and 1,200 lbs. respectively.



Price Includes All Trimmings, Also Injector and 5 Feet of Stack

No.	CYLINDER		H. P.	Drum, Inches	Lifting Cap. at 100 Feet per Minute	BOILER				Weight, Lbs.	Price
	Dia.	Stroke				H. P.	Diam.	Height	2-in. Tubes		
12B	5	5	5	8 x 15	600 lbs.	6	27 in.	5 ft. 9 in.	30	3200	\$410.00
13B	6	6	7	10 x 18	1000 lbs.	9	30 in.	6 ft. 10 in.	42	4500	500.00
14B	7	7	10	12 x 21	1500 lbs.	12	36 in.	6 ft. 10 in.	60	6300	615.00

WITTE GASOLINE HOISTS



This hoist is simple, compact and entirely self-contained, using but a small foundation and requiring no lining up or outside supports as all levers are directly attached to the hoist proper.

The engine is the Witte Standard horizontal, fully described elsewhere in this catalog, and the hoist part is designed with a large factor of safety on account of the lives of miners dependent on its reliability and strength.

Due to the adjustable connecting rod furnished, the engine will operate satisfactorily on Distillate, Naphtha Alcohol, Kerosene, Gas or Gasoline.

The engine, after being started, operates constantly at slow speed, which on signals is increased as desired by means of a speeder located at the operator's position.

The friction surfaces of the hoist drum are large so that very little pressure on the levers is required to raise the full load. The drum has internal frictions, same as used on standard steam hoists, no toggles or links being used.

All drum bearings are phosphor bronze bushed and the friction blocks are of well seasoned maple and easily replaced. The Witte hoist engines have all the improvements and attachments furnished with the Standard Witte engines.

SIZES AND DIMENSIONS

Actual Horse Power	Space Required, feet	Height, inches	Drum, Diameter and Face	Capacity of Drum, Feet of Rope	Size Cable, inches	Rope Speed, feet per Minute	Lifting Capacity at Rated Speed, Pounds	Approx. Shipping Weight, Lbs.	List Price, Each
9	4 x 7½	42	14 x 12	600	½	160	1400	4000	\$ 750.00
12	4½ x 8¼	50	16 x 14	800	¾	175	1700	5500	900.00
15	4¾ x 8¾	52	16 x 14	800	¾	170	2100	6000	1000.00
20	6 x 10	60	20 x 16	1200	¾	215	2300	7100	1400.00
25	6¼ x 10½	62	20 x 16	1200	¾	210	2800	7600	1500.00
35	7 x 12½	65	24 x 20	1600	¾	240	3600	12000	2000.00

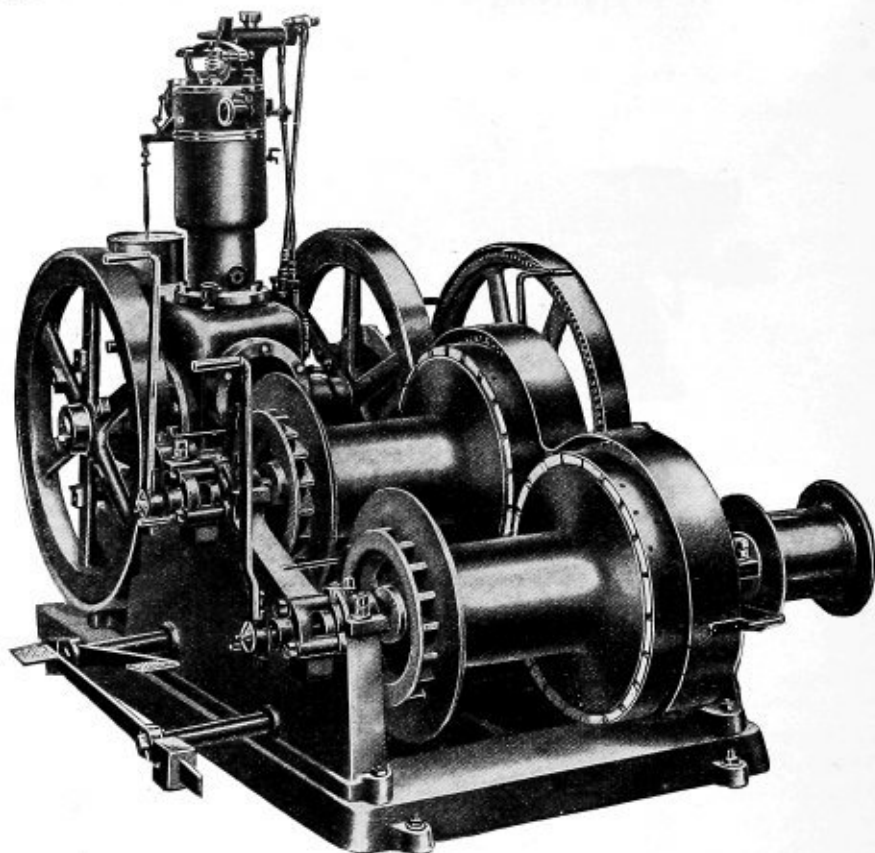
Sizes 9—15 and 25 H. P. are standard and usually carried in stock.

Equipment consists of water tank, depth indicator, one length of water pipe, drain valves and fittings, gasoline pump, gasoline tank and strainer, two lengths each of suction and overflow gasoline pipe with necessary fittings, exhaust muffler, one length of exhaust pipe, foundation bolts, complete electric battery, wrenches, lubricator, oilers, oil can, foundation plans and instruction book.

Engine shaft extends so that pulley may be added for driving other machinery.

On special order hoists may be sectionalized for mule-back transportation.

"MUNDY" CONTRACTORS' PORTABLE GASOLINE HOISTS



This hoist is designed for all kinds of hoisting where it is not practical to make use of the Steam or Electric Hoist—being a complete combination of Gasoline Engine and Friction Drum Hoist, all assembled on one Iron Bed Plate, and so constructed and arranged that the engine may be in constant motion and the hoisting and lowering of loads can be safely accomplished. The hoisting drum is provided with a powerful foot brake that will hold any load that can be hoisted with the engine.

SINGLE FRICTION DRUM HOISTS

Rated Horse Power.....	5 H. P.	8 H. P.	10 H. P.	12 H. P.
Diameter Hoist Drum.....	8 inches	10 inches	10 inches	12 inches
Length Hoist Drum.....	16 inches	20 inches	20 inches	22 inches
Weight will hoist 150 ft. per minute.	1000 lbs.	1500 lbs.	1800 lbs.	2500 lbs.
Weight will hoist 100 ft. per minute.	1500 lbs.	2250 lbs.	2700 lbs.	3750 lbs.

DOUBLE FRICTION DRUM HOISTS

Rated Horse Power.....	10 H. P.	12 H. P.	18 H. P.	25 H. P.
Diameter Hoist Drum.....	10 inches	10 inches	12 inches	12 inches
Length Hoist Drum.....	17 inches	20 inches	30 inches	32 inches
Weight will hoist.....	1800 lbs.	2500 lbs.	3000 lbs.	4500 lbs.
Speed will hoist per minute.....	150 feet	150 feet	150 feet	150 feet

MINERAL PROSPECTING MACHINES.

FOR EXPLORING PLACER GOLD MINES, TESTING FOR COAL, LEAD, ZINC, IRON, ETC., AND FOR MAKING SOUNDINGS FOR BRIDGE PIERS, FOUNDATIONS, ETC.



Above illustration shows No. 3 Traction (self-propelling) Placer Testing Machine, stripped of derrick and tools.

PLACER TESTING OUTFITS.

No.	Style	Depth, Feet		Weight Lbs.	Price	Weight, Boxed for Ocean Shipment	Net Extra for Boxing
		Friction Hoist	Cog Hoist				
1 P	Non-Traction	250	.....	7000	\$1300.00	9000 Lbs.	\$75.00
3 Q	Traction	350	500	13000	1630.00	15000 "	95.00
3 R	Non-Traction	350	500	10000	1420.00	12000 "	85.00
3 S	Without Power	350	500	7000	1010.00	9000 "	65.00
1 T	Sectional	250	.....	8000	1420.00	10000 "	85.00

Extras: Drive pipe and extra couplings and drive shoes for pipe are *not* included in above prices, for the reason that amounts required may vary with different localities. Prices quoted upon request.

MINERAL PROSPECTING MACHINES.

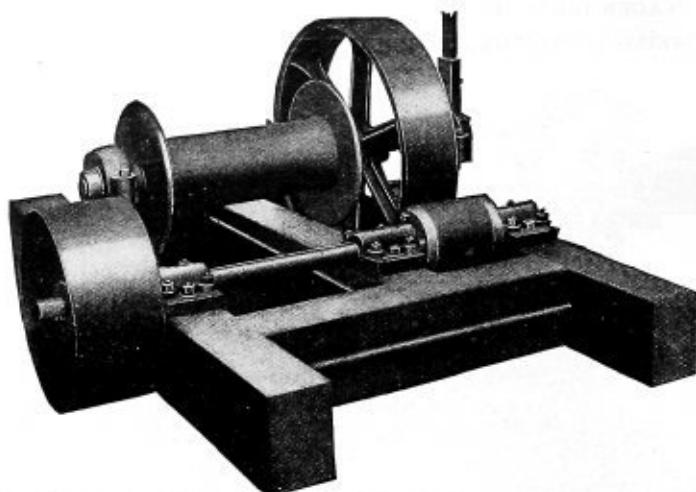
No.	Style	Depth, Feet		Weight, Lbs.	Price	Weight, Boxed for Ocean Shipment	Net Extra for Boxing
		Friction Hoist	Cog Hoist				
3 A	Traction	350	500	12000	\$1575.00	14000 Lbs.	\$ 95.00
3 B	Non-Traction	350	500	9500	1360.00	11500 "	85.00
3 C	N. T. No Power	350	500	6500	1025.00	8500 "	70.00
4 D	Traction	400	800	14000	1670.00	16000 "	100.00
4 E	Non-Traction	400	800	10500	1460.00	12500 "	90.00
4 F	N. T. No Power	400	800	8000	1125.00	10000 "	70.00

Extras: When wanted for coal testing, add one 3-inch center bit 8 ft. long, \$20.00; one 5½ or 6-inch shearing bit, \$20.00; one 3-inch vacuum sand pump, \$9.00 net extra.

We are also prepared to furnish "Oil Well Rigs," Portable and Traction, for Oil, Gas or Water Wells.

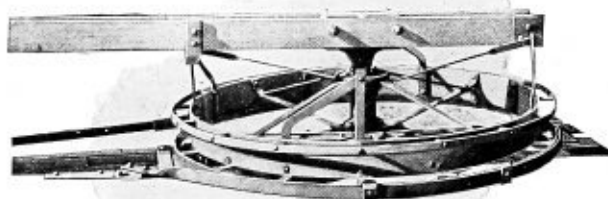
Be Sure and State Conditions, Character and Depth of Drillings.

SINGLE DRUM, FRICTION, BELT HOIST



No.	Hoisting Capacity on a Single Line, Lbs.	Horse Power Required	Revolution of Pulley Per Minute	Diameter and Face of Pulley, Inches	Diameter of Paper Friction, Inches	Diameter and Face of Friction Wheel, Inches	Diameter of Drums and Length Between Flanges, Inches	Floor Space Required (Bed,) Inches	Shipping Weight, Pounds	Price
1 U	500	5	250	16 x 6	8	24 x 5½	8 x 16	40 x 70	1100	\$140.00
2 U	1000	8	250	18 x 8	10	30 x 6½	8 x 20	44 x 80	1500	160.00
3 U	1500	12	250	20 x 10	12	34 x 7½	8 x 20	50 x 90	2000	190.00

Other sizes to order.

COMMON SENSE STEEL
MINER'S WHIM OR
HORSE-POWER HOIST-
ING MACHINE

- 1 Horse whim, speed 80 ft. per min.
2 Horse whim, speed 110 ft. per min.

The one horse whim will hoist from 650 to 1,000 lbs. of material in addition to weight of rope and bucket at a speed of 60 to 80 feet per minute. Whims are so constructed that they can be readily taken

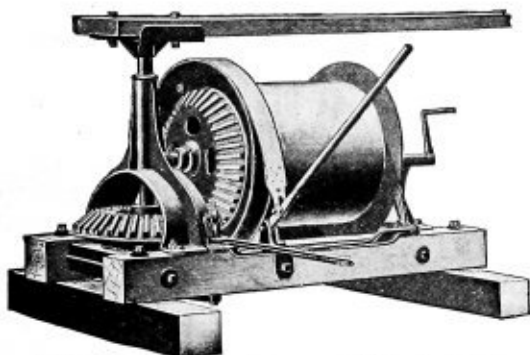
apart and packed in sections for mule back. Sweep is of oak and extra strong. The proper rope is ½ or ⅝-inch steel; the drum will wind up 18 feet of rope every time the horse goes round a circle. Fitted with a strong brake strap going entirely round the drum presenting large contact breaking surface. Attached to frame is a safety lock. This device locks the drum automatically whenever the horse stops, or if the single-tree, harness or other part of the mechanism breaks, thus preventing the bucket from running back in the shaft, and when the horse starts up again the lock releases itself and permits the drum to wind the bucket up.

The two horse whim is same as one horse, except that it has a larger drum wheel, two sweeps and two single-trees. Wheel is 7½ ft. diameter and two horses at an ordinary walk will hoist from 750 to 1,200 lbs. about 110 ft. per minute.

1 horse whim.	Net weight 900 lbs.	Gross weight 1,300 lbs.	75½ cu. ft.	Price.....	\$150.00
2 " " "	" " 1,400 "	" " 2,100 "	157 " "	Price.....	200.00

Prices include wrench, oiler, two sheaves for ½ or ⅝-inch wire rope including boxes and bolts, all the levers, connecting rods and every bolt and piece of iron work necessary. Also blue print for setting up.

HORSE-POWER HOISTING MACHINERY



WITH AUTOMATIC
SAFETY
ATTACHMENTS

Cut of No. 12 Horse-Power with Single Drum

These machines are varied in construction, so that they can be applied to different classes of work. An ordinary horse working constantly, and walking at the rate of $2\frac{1}{2}$ miles per hour, will raise 150 pounds on a straight line over a pulley, or 33,000 pounds, one foot in one minute. Experience has taught us that a horse operating a derrick working at intervals, and walking at the rate of 3 miles an hour, will exert a force equal to raising 200 pounds on a straight line over a pulley. We estimate capacity of our machines on this basis.

No. 11 MACHINE, SINGLE DRUM

Designed for heavy work—quarrying or building.

Capacity—Single rope, 4,800 pounds, 11 feet per minute; single block, 9,600 pounds, $5\frac{1}{2}$ feet, and 2 single blocks, 14,400 pounds per minute.

Dimensions—Gears, 20 and 43 teeth; drum, 22 inches long by 20 inches diameter; bed frame, 5 feet 3 inches by 2 feet 9 inches wide. No. 11 Machine, weight 1,400 pounds. Price each\$130.00

No. 12 MACHINE, SINGLE DRUM

Designed for the ordinary building of bridge approaches and foundations and for quarrying.

Capacity—Single rope, 2,400 pounds, 22 feet per minute; single block, 4,800 pounds, and 2 single blocks, 7,200 pounds per minute.

Dimensions—Gears, 34 and 34 teeth, drum, 22 inches long by 20 inches diameter; bed frame, 63 inches long by 33 inches wide; height, 3 feet 6 inches. No. 12 Machine, weight 1,300 pounds. Price each\$115.00

No. 12½ MACHINE, SINGLE DRUM

Designed for light lifting, such as slate, coal, etc.

Capacity—Single rope, 1,600 pounds, 33 feet per minute; single block, 3,200 pounds, 17 feet per minute.

Dimensions—Gears, 39 and 26 teeth; drum, 22 inches long by 20 inches diameter; bed frame, 63 inches long by 36 inches wide; height, 3 feet 6 inches. No. 12½ Machine, weight 1,200 pounds. Price each ..\$115.00

No. 13 MACHINE, SINGLE DRUM

Designed for light lifting at fast speed.

Capacity—Single rope, 960 pounds, 55 feet per minute; single block, 1,920 pounds, 28 feet per minute.

Dimensions—Gears, 45 and 18 teeth; drum, 22 inches long by 20 inches diameter; bed frame, 63 inches long by 39 inches wide; height, 3 feet 6 inches. No. 13 Machine, weight 1,200 pounds. Price each\$115.00

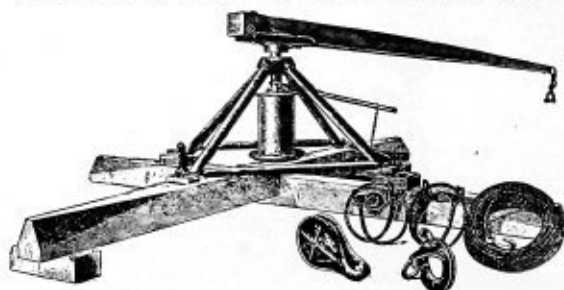
No. 14 MACHINE, SINGLE DRUM, DOUBLE SPEED

Designed for use of builders and quarrymen.

Capacity—Fast Speed: Single rope, 960 pounds, 55 feet per minute; single block, 1,960 pounds, 28 feet per minute. Slow speed; single rope, 2,400 pounds, 22 feet per minute; single block 4,800 pounds, 11 feet per minute; two single blocks, 7,200 pounds per minute.

Dimensions—Gears, 42 and 42, 45 and 18 teeth; drum, 22 inches long by 20 inches diameter; bed frame, 6 feet long by 39 inches wide; height, 4 feet. No. 14 Machine, weight 1,800 pounds. Price each\$175.00

CONTRACTORS' STUMP PULLERS



THE TWO-HORSE HAWKEYE STUMP MACHINE

Designed for Railroad, Levee and Drainage Canal contractors, who often have very heavy work to do and are obliged to take everything as it comes and are desirous of taking out all the roots to admit of free use of plows and scrapers.

This is a self-anchoring machine in which the bed timbers are let into narrow trenches in the ground and not requiring a stump for anchorage. Can be used in pulling hedge rows, stumps that have rotted above ground, for moving houses, etc.

Power—The sweep is 18 ft. and the drum 1 ft. in diam. Multiplying the power 36 times, and as 2 horses are used, 72 times; and by using the double power pulley, we have the power of 144 horses or sufficient to pull very large stumps. The drum shaft is 4 in. diam., and a drum brake is afforded by a simple device on the gear lever. The patent coupler furnished can be attached instantly without tools to any part of the pull rope, avoiding overhauling the slack of the rope, saving time and chafing of rope on drum.

The pull rope furnished is 200 ft. long, with which 3 acres can be cleared at a sitting.

Complete Outfit shown above, including 200 ft. special 15-16 plow steel pull rope in 2 100-ft. pieces, coupled with hook and thimbles spliced in; one all-steel safety double power pulley with 1½"x12 ft. detachable stump rope connected by hook; one patent steel coupler with 15-16"x12 ft. detachable stump rope with hook; one 15-16" stump chain with hook in each end, with sweep 8"x8"20 ft. and 10"x10"x16 ft. bed timbers complete, weight 2,800 lbs.Price \$312.50

Without sweep and bed timbers, but with ironwork for same, weight 1,850 lbs.Price \$275.00



Bolted on Shoes and Fitted for Anchoring to Stump

No. 3 COMBINATION STUMP PULLER

Can be set by anchoring to stump or anchored to the ground by bed timbers as shown by top cut, change can be made by putting in 8 extra bolts.

Machine is very rapid in action and in throwing in and out of gear; drum is 12" diam. and furnished with brake.

This machine is intended for extra heavy work, such as the yellow pine stumps in the south and when used with two horses and one Double Power Pulley develops the power of 128 horses or with two pulleys 192 horses.

Bed Timbers for self-anchoring are 10"x10"x16 ft. long, of seasoned Norway pine or Oregon fir, framed, planed and painted. Weight about 750 lbs. per pair. Price per pair, \$15.00

Sweep is 8x8 at one end, tapering to 4x8 at other end and 17 ft. 9 in. long, of Norway pine or Oregon fir, planed, painted and striped, weight 200 lbs.Price \$10.00

Multiplying Power Pulley, with 16 ft. 1½" rope, sheave, clevis, pin, hook and clipsPrice 31.25

Safety Double Power Pulley, with 12 ft. 1½" rope, pin, hook and thimble and "C" hook ..Price 40.00

Prices of No. 3 Machine, as shown in smaller cut above, with special 15-16 plow steel pull rope; clip for drum; 14 ft. 15-16 anchor rope with clips; one patent coupler with 12 ft. 15-16 stump rope and rope hook attached; bolts, hooks, etc., for sweep; 8 extra bolts for attaching bed timbers.

With 100 ft. of pull rope 1,350 lbs.Price \$185.00

With 150 ft. of pull rope 1,425 lbs.Price 215.00

With 200 ft. of pull rope 1,500 lbs.Price 241.25

Bed Timbers, etc., are extra. See prices above.

"PROVIDENCE" HAND POWER CAPSTANS

The change from speed to power, or power to speed, is made by simply changing the direction of rotation of the Capstan Bar; that is, the men walk around in the opposite direction. A feature of much importance is that the strain is taken by both the outside and inside pawls, thus giving double security, and relieving the men on the bars from danger.

The "AA" and "BB" Capstans were designed for those requiring especially strong small Capstans; they are of the same general dimensions as Nos. A and B, but the castings are thicker and heavier, the shafts are larger and the gears are of open hearth steel.



Fig. 563

No.	Diameter of Barrel over Whelps, Inches	Diameter of Base, Inches	Height, Inches	Weight, Pounds	Price, Each
O	7½	19	21	250	\$ 27.00
A	8	23	28	400	36.00
AA	8	23	28	450	40.00
B	8½	24½	31½	500	45.00
BB	8½	24½	31½	550	50.00
C	9½	29½	34½	750	65.00
D	10½	32	38	1100	85.00
E	11½	34	39½	1250	100.00

Fig. 563

"PROVIDENCE" SINGLE-BARREL STEAM CAPSTAN

With Non-reversing Engines

Double gearing provides power or speed. The changes are effected by placing the block key in the base for power and in the head for speed. The speed can be increased about three times in this way when the load does not require the low gear for power.

The engines can be hung under the deck, as represented in the illustration, or can be laid on top of the deck below. Non-reversing or brass-link reversing engines are furnished.

Open hearth steel is used for the center and pinion gears in the capstan; the bushings are made of brass, and an iron worm gear and a bronze worm reduce friction and wear. A turned and polished brass cover for the top of the capstan has the name or any other engraving which may be specified.

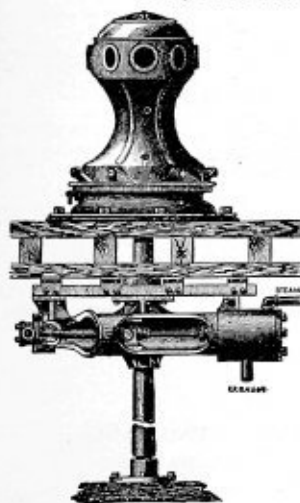


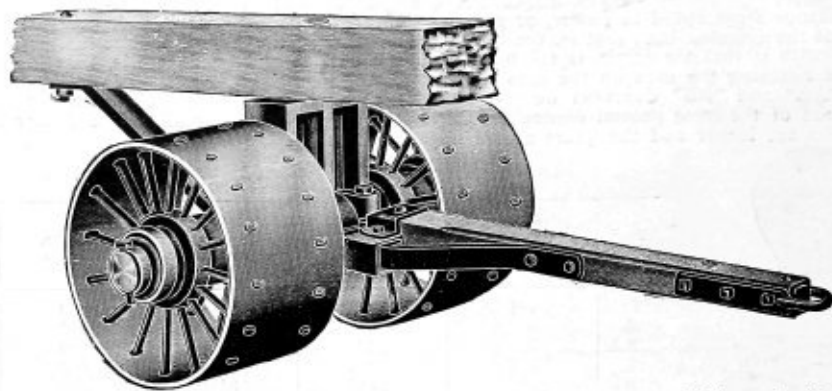
Fig. 556

Fig. 556

No.	Diameter of Barrel, Inches	Diameter of Base, Inches	Height, Inches	Double Cylinders, Inches	Shipping Weight, Pounds	Price, Each	Add for Brass-link Reversing Engines
A	8	21	25½	4x4	1,000	\$337.50	\$45.00
B	8½	22½	31	4x6	1,700	405.00	45.00
C	9½	27¼	33½	4x6	2,000	435.00	45.00
D	10½	29¼	38	5x7	3,000	502.50	67.50
E	11½	31¼	38¾	6x8	3,800	585.00	67.50
F	12½	33	42½	7x8	4,800	712.50	90.00
F	12½	33	42½	8x8	5,200	765.00	90.00
G	15¾	42	42	7x8	5,600	817.50	90.00
G	15¾	42	42	8x8	6,000	855.00	90.00

H.Channon Company. Chicago.

ALL STEEL HOUSE-MOVING TRUCKS



The accompanying cut illustrates a single truck, showing the beams or timbers, in place. We do not furnish the beams, but merely include it in cut to show its position. Each truck consists of two wheels, one round steel axle with solid iron bolster attached. This bolster extends above the wheels so as to permit the wheels to turn under the beam, and is 18 inches to 22 inches wide at top, according to the width of tire used. The wheels track 30 inches from center to center of tire, making axle from 48 inches to 52 inches long over all. Tongue is oak, heavily ironed, complete with braces and heavy king bolt.

An outfit generally consists of four trucks which are capable of moving a large-size building. Each rear truck has a short tongue five feet long which is lashed or fastened to the beam.

The front trucks have a 12-foot tongue.

These prices are for one truck only, each truck consisting of two wheels, one round steel axle with bolster attached, and tongue complete with braces and king bolt.

Height of Wheel, Inches	Size of Steel Axle, Inches	With Tire 10 in. Wide and $\frac{3}{4}$ in. Thick		With Tire 10 in. Wide and $\frac{3}{4}$ in. Thick		With Tire 12 in. Wide and $\frac{5}{8}$ in. Thick		With Tire 12 in. Wide and $\frac{5}{8}$ in. Thick		Carrying Capacity per Truck, Tons
		Price	Weight, Lbs.	Price	Weight, Lbs.	Price	Weight, Lbs.	Price	Weight, Lbs.	
24 or less	3 $\frac{1}{2}$	\$42.75	949	\$44.25	999	\$44.75	1015	\$46.25	1075	15 to 20
24 or less	4	46.75	994	48.25	1044	48.75	1060	50.25	1120	20 to 25
26	3 $\frac{1}{2}$	43.75	979	45.25	1037	45.75	1045	47.25	1109	15 to 20
26	4	47.75	1024	49.25	1082	49.75	1090	51.25	1154	20 to 25
28	3 $\frac{1}{2}$	44.75	1015	46.25	1075	46.75	1085	48.25	1155	15 to 20
28	4	48.75	1060	50.25	1120	50.75	1130	52.25	1200	20 to 25
30	3 $\frac{1}{2}$	45.75	1055	47.25	1119	47.75	1125	49.25	1195	15 to 20
30	4	49.75	1100	51.25	1164	51.75	1170	53.25	1240	20 to 25

NOTE—The truck with wheels 24 inches high, 12 x $\frac{5}{8}$ inch tire and 3 $\frac{1}{2}$ inch steel axle is the popular size.

HARD MAPLE ROLLERS

For House and Machinery Moving

OIL
COATED



ENDS ARE
PAINTED

Turned from seasoned quarter-sawn rock maple squares, thus using the best and toughest part of the log. While they cost more than rollers turned from squares "with hearts," they are stronger, and more durable.

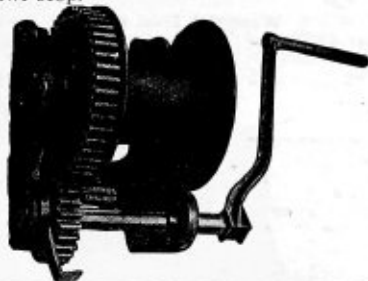
SIZES			SIZES			SIZES		
Diameter, inches	Length	List Price Each	Diameter, inches	Length	List Price Each	Diameter, inches	Length	List Price Each
3	3 ft.	\$9.50	5	6 ft.	\$1.90	7	4 ft. 8 in.	\$2.90
3	4 "	.60	5 $\frac{1}{2}$	5 "	2.00	7	5 "	3.10
3 $\frac{1}{2}$	3 "	.70	5 $\frac{1}{2}$	6 "	2.30	7	6 "	3.60
3 $\frac{1}{2}$	4 "	.85	6	3 "	1.50	7	7 "	4.30
4	3 "	.80	6	4 "	1.80	7 $\frac{1}{2}$	4 "	2.80
4	4 "	1.00	6	4 " 8 in.	2.10	7 $\frac{1}{2}$	4 ft. 8 in.	3.20
4	5 "	1.25	6	5 "	2.25	7 $\frac{1}{2}$	5 "	3.50
4	5 " 6 in.	1.35	6	6 "	2.70	7 $\frac{1}{2}$	6 "	4.20
5	3 "	1.10	6	7 "	3.10	8	4 "	4.00
5	4 "	1.35	7	3 "	2.00	8	5 "	3.30
5	5 "	1.70	7	4 "	2.50	8	6 "	4.70

Intermediate sizes take next higher list.

HAND POWER WINCHES

THE "JUNIOR" WINCH

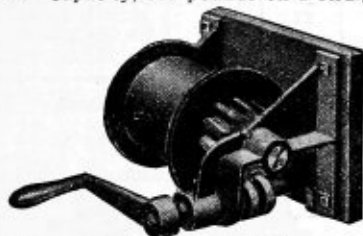
This is a handy winch for general hoisting. Will raise 1,000 pounds on a straight lift. Fitted with pawl stop.



Size Frame, Inches	Size Large Gear Wheel, Inches	Size of Drum, Inches	Weight of Winch, Pounds	Price, Each
13½x10	11¼ dia.	5½ dia.x6 wide	75	\$15.00

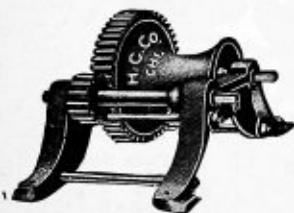
SAFETY WORM-GEARED WINCH

This winch will hold a load suspended at any point. No pawl stop used. The load can not slip or run down because the handle must be turned to lower. Capacity, 500 pounds on a straight lift.



Size of Drum, Inches	Weight of Winch, Pounds	Price, Each
5½ dia.x6 wide	50	\$10.00

THE "LITTLE DANDY" WINCH

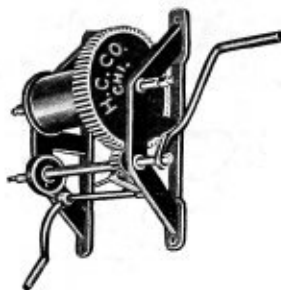


This winch can be fastened to floor or wall. Drum is concave, so that a rope of any length can be used. With a single and double block one ton can be raised on a straight lift. Arranged for two speeds and two crank levers furnished.

Size Frame, Inches	Size Gear Wheel, Inches	Height, Inches	Size of Drum, Inches	Weight of Winch, Pounds	Price, Each
13x19	10½ dia.	11	6¼ wide dia. center 3¾ " small end 5¾	75	\$15.00

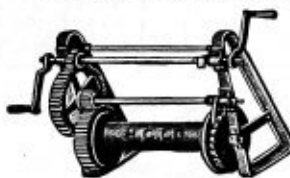
THE "HERCULES" WINCH

Will raise about 1,000 pounds on a straight lift and can be attached either to the wall or floor. Lowering is controlled by an improved strap and lever brake, and crank gear can be shifted so that it will not revolve when load is being lowered. Is arranged for two speeds and two crank levers are furnished with it.

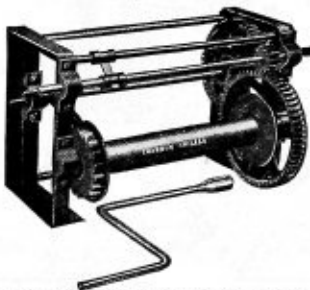


Over All Dimensions, Inches	Size of Large Gear Wheel, Inches	Diameter of Drum, Inches	Length of Drum, Inches	Weight of Winch, Pounds	Price, Each
21x21	15 dia.	5	13	100	\$30.00

WAGON WINDLASSES



Triangular Frame



New Style Improved Square Frame

These windlasses are attached to front of heavy wagons for hauling and unloading heavy machinery, safes, stone, etc.

No.	Capacity in Tons	Weight of Winch, Pounds	Price, Each
1	2	300	\$35.00
2	4	400	40.00
3	6	500	47.00
4	10	600	55.00

CRABS OR WINCHES

Iron Frames for Manila Rope

No. 29. Single Purchase



Size	Diameter of drum, inches	Length of drum between flanges, in.	Capacity with a double and triple block, tons	PRICE EACH		
				Without Brake	With lever brake	With screw brake
A	4	20	5	\$35.00	\$40.00	\$45.00
B	6	22	7	45.00	50.00	55.00
C	9	16	12	85.00	95.00	105.00
D	9	22	12	95.00	105.00	115.00

No. 30. Double Purchase



Size	Diameter of drum, inches	Length of drum between flanges, in.	Capacity with a double and triple block, tons	PRICE EACH		
				Without Brake	With lever brake	With screw brake
A	4	20	5	\$50.00	\$55.00	\$60.00
B	6	22	7	60.00	65.00	70.00
C	9	16	12	100.00	110.00	120.00
D	9	22	12	110.00	120.00	130.00

No. 31. Single Purchase

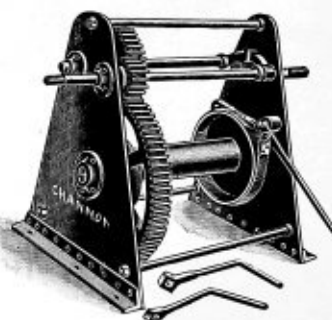
Wrought Iron Sides



Size	Diameter of drum, inches	Length of drum between flanges, in.	Capacity with a double and triple block, tons	PRICE EACH		
				Without brake	With lever brake	With screw brake
A	4	20	5	\$55.00	\$60.00	\$65.00
B	6	22	7	65.00	70.00	75.00
C	9	16	12	105.00	115.00	125.00
D	9	22	12	115.00	125.00	135.00

No. 32. Double Purchase

Wrought Iron Sides



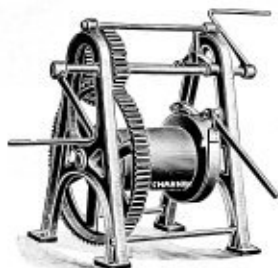
Size	Diameter of drum, inches	Length of drum between flanges, in.	Capacity with a double and triple block, tons	PRICE EACH		
				Without brake	With lever brake	With screw brake
A	4	20	5	\$70.00	\$75.00	\$80.00
B	6	22	7	80.00	85.00	90.00
C	9	16	12	135.00	150.00	160.00
D	9	22	12	145.00	160.00	170.00

CRABS OR WINCHES

IRON FRAMES FOR WIRE ROPES

THESE CRABS ARE CONSTRUCTED WITH BARRELS OF LARGER DIAMETER THAN THOSE ON THE PRECEDING PAGE

No. 33 DOUBLE PURCHASE



Size	Diam. of Drum, inches	Length of Drum, inches	Capacity with Double and Triple Blocks	PRICE EACH		
				Without Brake	With Lever Brake	With Screw Brake
A	7½	13	2 tons	\$50.00	\$55.00	\$60.00
B	10	14	3 tons	70.00	75.00	80.00
C	11	15	5 tons	75.00	80.00	90.00
D	12½	16	7 tons	125.00	135.00	145.00
E	14	18	10 tons	150.00	170.00	190.00
F	15	20	12 tons	250.00	270.00	290.00

No. 34 DOUBLE PURCHASE—WROUGHT IRON SIDES



Size	Diameter of Drum, inches	Length of Drum, inches	Capacity with Double and Triple Blocks	PRICE EACH		
				Without Brake	With Lever Brake	With Screw Brake
A	7½	13	2 tons	\$70.00	\$75.00	\$80.00
B	10	14	3 tons	90.00	95.00	100.00
C	11	15	5 tons	95.00	100.00	110.00
D	12	16	7 tons	145.00	155.00	165.00
E	14	18	10 tons	180.00	200.00	220.00
F	15	20	12 tons	280.00	300.00	320.00

Any of our Crabs may be fitted with one or two Winch Heads as per Illustrations below



With One Winch Head



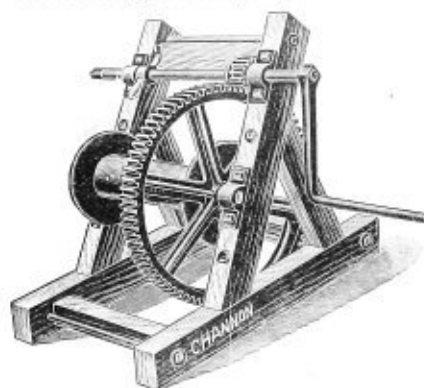
With Two Winch Heads

Extra for Winch Heads, Single, \$10.00 net; Double, \$20.00 net.

HAND POWER WINCHES

With Wooden Triangle Frames to be placed on ground or bolted to floor

No. 18. Single Drum, Single Purchase.

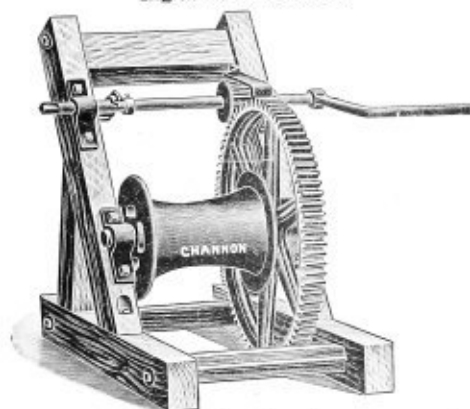


Nominal Capacity, 5 tons.

Size	Kind of Rope	Diam. of Drum, inches	Length of Drum between Flanges, inches	Load for Two Men Single Line, lbs.	Load for Two Men Double Line, lbs.	Price Each
A A	Manila	5	17	1,700	3,400	\$38.50
A	"	6	21	1,700	3,400	41.00
B	"	6	26	1,700	3,400	42.50
C	"	6	30	1,700	3,400	43.50
D	Wire	9	16	1,200	2,400	43.00
E	"	9	21	1,200	2,400	46.00

For Brake, Brake Band and Wheel Band add \$10.00 to above list.

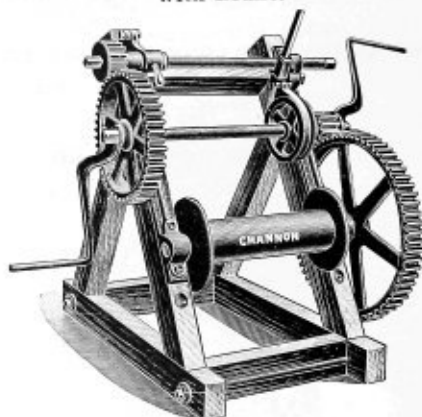
No. 28. Single Drum, Single Purchase with Surging or Concave Drum.



Nominal Capacity, 5 tons.

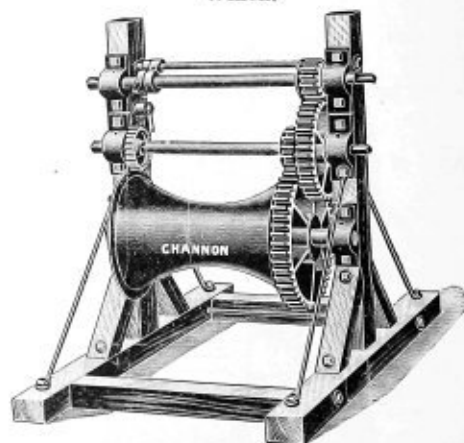
Size	Diameter of Drum at Center and at Ends, inches	Length of Drum between Flanges, inches	Load for Two Men Single Line, lbs.	Load for Two Men Double Line, lbs.	Price, Each
A	5 tapered to 9	12	1,700	3,400	\$45.00
B	6 " " 10	12	1,700	3,400	47.00
C	7 " " 13	14	1,700	3,400	48.00

No. 185. Single Drum, Double Purchase Winch with Brake.



Size	Kind of Rope	Diam. of Drum, inches	Length of Drum between Flanges, inches	Pull of Two Men on Single Line	Price Each
A	Manila	6	21	3,500 lbs.	\$70.00
B	"	6	26	3,500 "	75.00
C	"	6	30	3,500 "	80.00
D	Wire	9	16	3,000 "	70.00
E	"	9	21	3,000 "	75.00

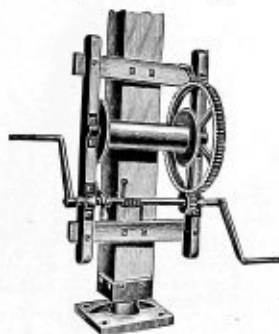
No. 280. Single Concave Drum, Double Purchase Winch.



Size	Diam. of Drum at Center and at Ends, inches	Length of Drum between Flanges, inches	Load for Two Men Single Line, lbs.	Load for Two Men Double Line, lbs.	Price Each
A	5 tapered to 9	12	3,400	6,800	\$65.00
B	6 " " 10	12	3,400	6,800	67.00
C	7 " " 13	14	3,400	6,800	68.00

WOOD FRAME HAND POWER DERRICK WINCHES

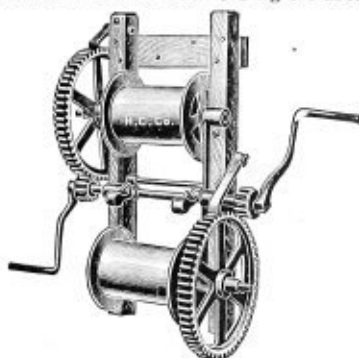
No. 20. Single Drum, Single Purchase



Nominal Capacity, 5 Tons

Size	For Rope, Kind	Diam. of Drum, inches	Length of Drum, inches	Nominal Load for Two Men, Single Line, pounds	Nominal Load for Two Men, Single Block, pounds	Price Each
F	Manila	5	17	1,700	3,400	\$30.00
A	"	6	21	1,700	3,400	36.00
B	"	6	26	1,700	3,400	37.50
C	"	6	30	1,700	3,400	38.50
D	Wire	9	16	1,200	2,400	38.00
E	"	9	21	1,200	2,400	41.00

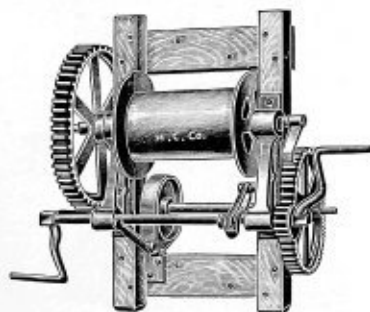
No. 26. Double Drum, Single Purchase



Nominal Capacity, 5 Tons

Size	For Rope, Kind	Diam. of Drum, inches	Length of Drum between Flanges, inches	Load for Two Men, Single Line, pounds	Load for Two Men, Single Block, pounds	Price Each
A	Manila	6	21	1,700	3,400	\$50.00
B	"	6	26	1,700	3,400	55.00
C	"	6	30	1,700	3,400	60.00
D	Wire	9	16	1,200	2,400	60.00
E	"	9	21	1,200	2,400	65.00
F	Manila	5	17	1,000	2,000	47.00

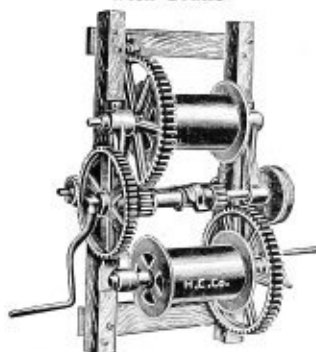
No. 25. Single Drum, Double Purchase, with Brake



Nominal Capacity, 20 Tons

Size	For Rope, Kind	Diam. of Drum, inches	Length of Drum, inches	Load for Two Men with Single Block		Price Each
				Fast Speed, pounds	Slow Speed, pounds	
A	Manila	6	21	3,400	12,000	\$68.00
B	"	6	26	3,400	12,000	72.00
C	Wire	9	16	2,400	9,000	72.50
D	"	9	21	2,400	9,000	77.00

No. 27. Double Drum, Double Purchase, with Brake

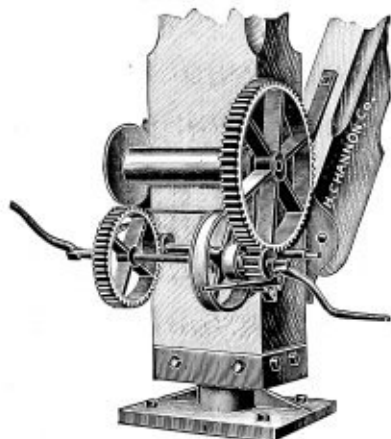


Nominal Capacity, 20 Tons

Size	For Rope, Kind	Diam. of Drum, inches	Length of Drum between Flanges, inches	Load for Two Men with Single Block, pounds		Price Each
				Fast Speed	Slow Speed	
A	Manila	6	21	3,400	12,000	\$100.00
B	"	6	26	3,400	12,000	110.00
C	Wire	9	16	2,400	9,000	115.00
D	"	9	21	2,400	9,000	125.00

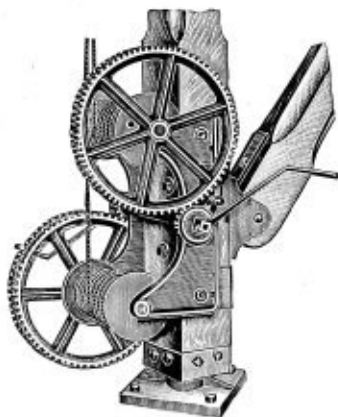
IRON FRAME HAND POWER DERRICK WINCHES.

To be Bolted to Mast or Post.

No. 21. SINGLE DRUM, DOUBLE PURCHASE
With Brake Wheel.

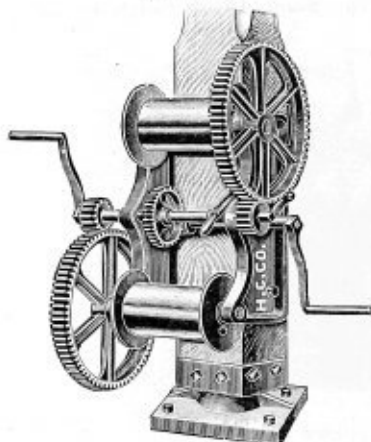
Nominal Capacity, 10 Tons

Size	Kind of Rope	Diameter of Drum, inches	Length of Drum between Flanges, inches	Load for two men with single block, pounds		Price Each
				Fast Speed	Slow Speed	
A	Manila	6	21	3,400	7,500	\$65.00
B	"	6	26	3,400	7,500	68.00
C	Wire	9	16	2,400	5,000	70.00
D	"	9	21	2,400	5,000	73.00

No. 22. DOUBLE DRUM, SINGLE PURCHASE,
No Brake

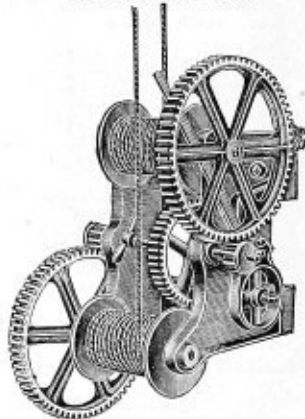
Nominal Capacity, 6 Tons

Size	Kind of Rope	Diameter of Drum, inches	Length of Drum, inches	Load for two men with single line, pounds		Price Each
				Load for two men with single block, pounds		
A	Manila	6	21	1,700	3,400	\$60.00
B	"	6	26	1,700	3,400	64.00
C	Wire	9	16	1,200	1,200	65.00
D	"	9	21	1,200	1,200	69.00

No. 23. DOUBLE DRUM, DOUBLE PURCHASE
No Brake

Nominal Capacity 10 Tons

Size	Kind of Rope	Diameter of Drum, inches	Length of Drum between Flanges, inches	Load for two men with single block		Load, 2 men sin. and dou. blk., or 4 men with sin. blk.		Price Each
				Fast spd., lbs.	Slow spd., lbs.	Fast spd., lbs.	Slow spd., lbs.	
A	Manila	6	21	3,400	7,500	7,000	17,500	\$76.00
B	"	6	26	3,400	7,500	7,000	17,500	80.00
C	Wire	9	16	2,400	5,000	5,000	12,000	81.00
D	"	9	21	2,400	5,000	5,000	12,000	85.00

No. 24. DOUBLE DRUM, DOUBLE PURCHASE
With Brake Wheel

Nominal Capacity, 20 Tons

Size	Kind of Rope	Diameter of Drum, inches	Length of Drum between Flanges, inches	Load for two men with single block		Load, 2 men sin. and dou. blk., or 4 men with sin. blk.		Price Each
				Fast spd., lbs.	Slow spd., lbs.	Fast spd., lbs.	Slow spd., lbs.	
A	Manila	6	21	3,400	12,000	7,000	24,000	\$87.50
B	"	6	26	3,400	12,000	7,000	24,000	93.00
C	Wire	9	16	2,400	9,000	5,000	18,000	92.50
D	"	9	21	2,400	9,000	5,000	18,000	98.00

CONTRACTORS' AND BUILDERS' PORTABLE MATERIAL ELEVATORS

In the opposite illustration we show a complete outfit for the elevation of brick, mortar, etc., in high buildings.

This machinery has a capacity of supplying about 100 masons with material, and as the cages are run at a high rate of speed, distance to be elevated does not lessen its capacity.

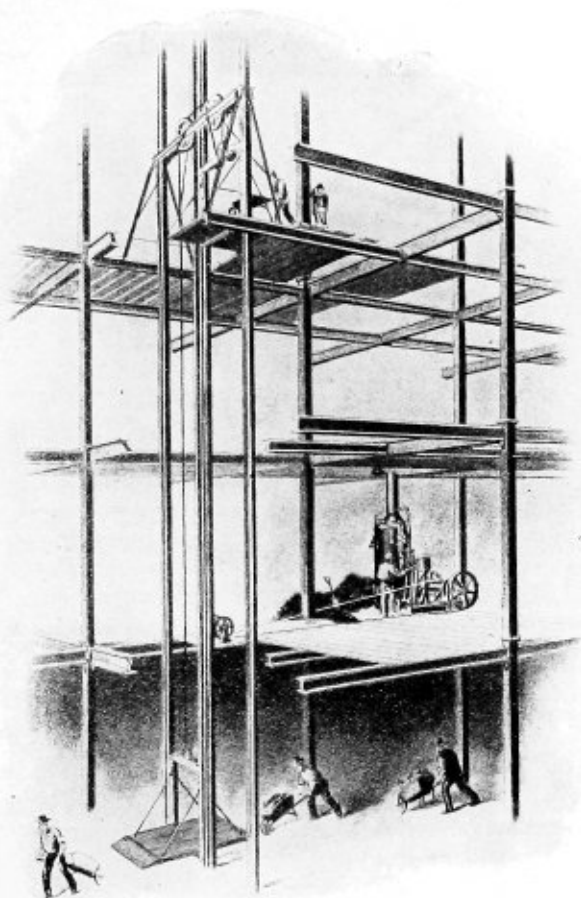
You will notice that two cages are used, so that one cage, wheelbarrow, etc., balances the other, leaving only the weight of the material for the engine to hoist.

When one cage is going up the other is always coming down; one cage is always in position ready to be loaded, while the other is being unloaded.

The cages may be stopped at any point.

Wire hoisting rope is provided for as many stories as ordered, the extra rope not used is wound on drum at top of each cage, and when moved up to another floor enough is unwound to make the necessary length.

For further particulars see opposite page.



The above illustration shows elevators operated by steam engine; they may also be operated by gasoline or electric hoists, and by horse only.

The system of running the hoist lines for steam engine is shown by cut. The two ends of the rope are attached to the tops of the two cages. The rope is endless, passing over top sheaves to the bottom sheaves and around the engine driving sheave with two or three wraps around sheave.

Where horse is used the hoist rope is run through a snatch block at the bottom. This block is attached to a column or floor joist.

Continued on opposite page



Cut Shows a Single Cage as Furnished

CONTRACTORS' AND BUILDERS' PORTABLE MATERIAL ELEVATORS



The head of the elevator or overhead "horse," supporting the upper sheaves at top of building, is made of hard pine, strongly trussed and braced by angle iron legs and braces. The cages have ash platforms 4x6 ft., the uprights and cross piece are ash, faced with 10 gauge sheet steel. Cages are very strongly braced at all parts.

We always send wire guides for cages, as they have proven to be the best for the purpose, the advantage being in smooth running and greater convenience in moving from floor to floor. We can furnish cages arranged for 2x4 wooden guides if preferred at same price. Safety stops or pawls are provided which hold the load at any point.

Wire guide ropes furnished are $\frac{3}{8}$ -inch diameter, galvanized.

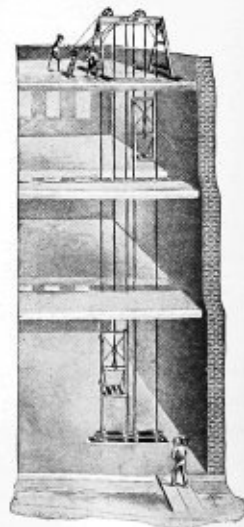
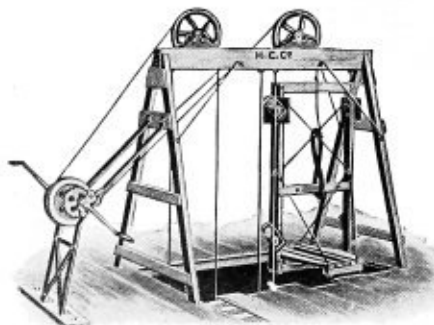
Wire hoisting rope $\frac{3}{8}$ -inch diameter has 6 strands and a hemp center, each strand composed of 19 wires. Weight of outfit complete with ropes about 2000 lbs.

Above cut shows overhead horse, with top sheaves, which sets on top of the building, also shows the two cages in position with lower sheaves between them.

Price of Outfit Complete, with Overhead Horse, Top Sheaves, Two Cages, Bottom Sheaves and Necessary Wire for Four Guides and Hoisting Rope:

50 Foot Guides.....	Price, \$185.00	80 Foot Guides.....	Price, \$215.00	100 Foot Guides.....	Price, \$235.00
75 " " " " " "	210.00	90 " " " " " "	225.00	120 " " " " " "	265.00

No. 46 Builders' Hand Power Double Acting Hod Elevators



Capacity to height of four stories, 20,000 to 30,000 brick in 10 hours.

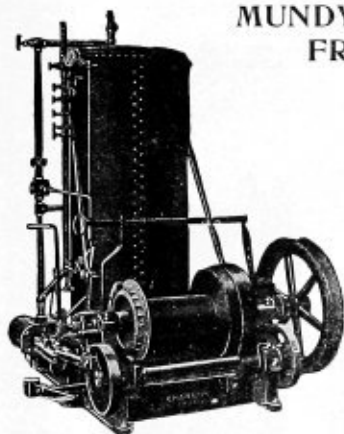
Area of space required, 3 ft. 6 in. x 6 ft. 3 in.

Furnished with wire guides which are quickly and easily put up and are not subject to wear and tear as much as wood leaders.

Each cage or platform carries two hods. This outfit works on the counter-balance system, and can be operated at a very fair rate of speed with moderate power, each man hoisting up his own hod, thereby shifting the labor from the hand to the shoulder, and from the shoulder to the hand, alternately, which change is very acceptable to the workmen.

Price complete with overhead horse and sheaves, winch, two cages, lower sheaves, wire rope for hoisting and for guides or leaders, also 10 brick hods and 5 mortar hods..... \$225.00 Net

MUNDY HORIZONTAL DOUBLE CYLINDER, SINGLE FRICTION DRUM, LINK-REVERSING, BRICK MASONS' ENGINES



Size Number of Engine	Horse-power Usually Rated	DIMENSIONS.				Weight Hoisted With Clutch Wheel, Lbs.	Weight Hoisted, Single Rope, Average Speed on Drum, Lbs.	DIMENSIONS OF BOILERS				Estimated Shipping Weight with Boiler Complete, Lbs.
		Cylinders		Hoisting Drums				Diameter, Inches	Height, Inches	Number of Tubes, 2-inch Diameter	Length of Tubes, Inches	
		Diameter, Inches	Stroke, Inches	Diameter, Inches	Length, Inches							
261	8	4½	6	9	18	1000	2000	28	68	40	42	4500
263	10	5	8	10	20	1350	2500	32	80	55	52	5000
265	12	5½	10	12	20	2000	3500	34	84	60	56	6400
267	16	6¼	10	14	22	2600	4000	36	84	65	56	7000
269	20	6½	12	14	24	3400	5000	38	90	77	62	8000
271	22	7¼	10	14	26	3900	6500	40	90	85	62	8600

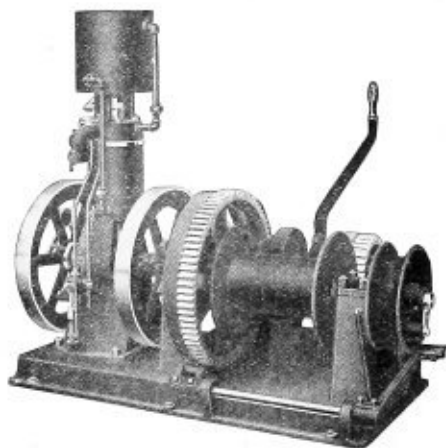
GASOLINE HOIST

For Operating Double Cage Material Elevators. Hoist is Also Equipped With a Drum for Direct Hoisting.

The drum can be run independent of the cable sheave which operates the elevator platforms and consequently makes a valuable addition to the outfit. In case the operator desires to hoist material that cannot be taken up on the regular platforms it can be done without loosening or disturbing the elevator cable.

It is provided with reverse clutch mechanism and foot brake with ratchet. The clutch lever is placed in the most convenient position for the operator. The cable sheave over which the elevator cable runs is 11½ inches in diameter, and when the engine is operated at normal speed the elevator platforms will run at a speed of 125 feet per minute.

The vertical Gasoline Engine is fitted with cast iron cooling tank, bolted on top of Cylinder as shown in cut. This makes the outfit practically self-contained as there is no galvanized iron cooling tank to find room for.



GENERAL SPECIFICATIONS AND DIMENSIONS

Main bearings 5 in. long, babbitted.
Clutch shaft 2 in. diameter.
Drum shaft 2 in. diameter.
Gears 3 pitch, 2½ in. face.
Back gear 9 to 1.

Floor space 31x63 in.
Sheave for elevating cable 11½ in. diameter.
Hoisting drum 15½ in. long, 8½ in. diameter, will carry 700 ft. of ½-in. steel cable.

Price, with 4 H. P. \$550.00
Price, with 6 H. P. 600.00

Brake wheel 24¾ in. diameter, 3 in. face for 2½ in. brake band. Price, \$600.00.

DUMB WAITERS

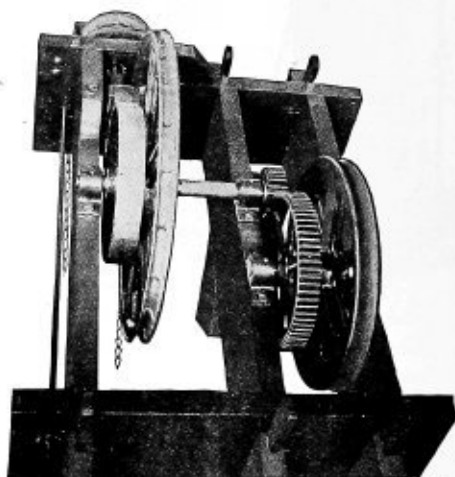
"Little Dandy"



1	Story Travel, price complete	\$50.00
2	" " " "	55.00
3	" " " "	65.00

Our Little Dandy dumb waiter has a capacity of from 25 to 500 pounds. It is easily operated and quite inexpensive. It is neat in appearance. Cars are made with or without movable shelves. Size, 24 inches wide, 20 inches deep and 28 inches high.

"Geared"

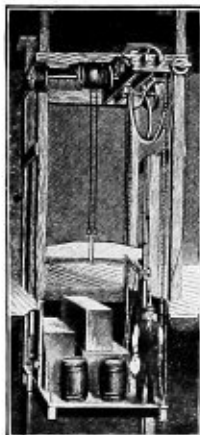


1	Story Travel, price complete.....	\$ 75.00
2	" " " "	85.00
3	" " " "	100.00

Our geared dumb waiters have a capacity of from 50 to 500 pounds; are easy to operate and are noiseless. Cars are made of ash, 24 inches wide, 20 inches deep, 28 inches high. Cars can be made any size desired.

HAND POWER ELEVATORS

“Center Lift”



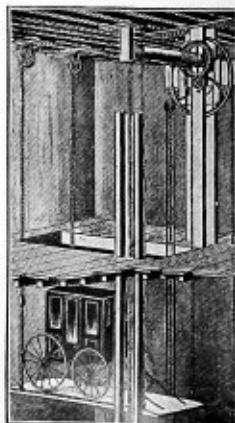
The difference between the carriage lift and center lift elevators is in the platform; the former, being suspended by a cable at each corner, affords plenty of head-room necessary for the handling of vehicles.

PLATFORMS MADE ANY SIZE WANTED

The parts of these machines are described as follows:

One cast iron hand rope wheel with brake pulley attached, one cast iron gear and pinion, two drums made up of cast iron heads with maple centers spirally grooved for cables. All shafts of cold rolled steel operating on self lubricating bushings which require no oil and reduce friction to a minimum. Cables are of the best annealed Swedish iron; hand and brake ropes are of pure manila.

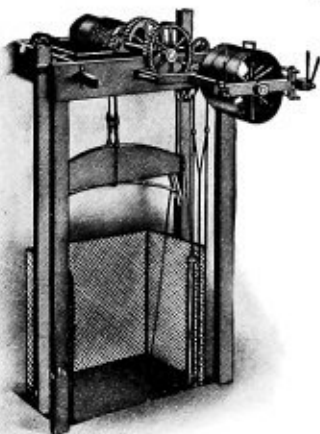
• Carriage Lift”



PRICES UPON APPLICATION

ELEVATORS

NO. 8 BASEMENT HOIST



No. 4 Power Attachment

Car is made of ash, thoroughly braced with steel and riveted.

It is raised and lowered by hoisting winch, which can be bolted to floor.

Winch is built very strongly, and fitted with our improved brake.

**Platform Made Any Size
Desired**

Capacity 500 to 6000 Lbs.



No. 8 Basement Hoist

NO. 4 POWER ATTACHMENT

To anyone contemplating purchasing a power elevator and who does not wish to incur the expense of a worm gear machine, we offer our Power Attachment No. 4.

This machine is thoroughly constructed and particularly adapted for light loads—500 to 2,000 lbs.

It is a noiseless combination provided with two cut gears and pinions, one or two drums (whichever is necessary), with cast heads and spirally grooved maple centers scored for cables.

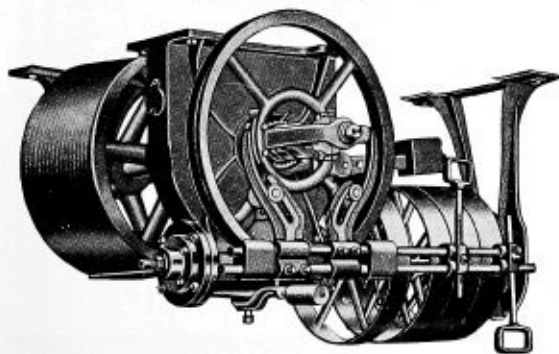
The pulleys are set in a cast iron frame and supplied with a shifting device.

It is provided with our improved brake, which is noiseless, positive and secure.

Platforms of any size are made of well seasoned ash, thoroughly braced and bolted, and provided with maple flooring. They are also provided with the Union Patent Safety System, and in case of breakage of the hoisting cables, the safety dogs are thrown in contact with the guide strips, thus preventing the fall of car.

The machine is furnished with three cables (two for hoisting and one for counterbalance) of the best annealed Swedish iron, six strands, with nineteen wires to each strand.

Improved Belt Power Worm Geared Elevator No. 5

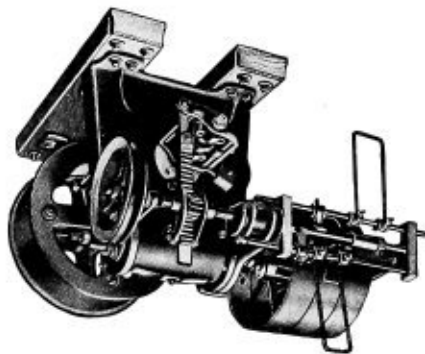


This elevator is substantially built, all parts being of exceptional strength and provided with the latest safety appliances.

**Speed 45 Feet Per Minute. Platform Made Any Size
Wanted**

Capacity 2000 to 4000 Lbs.

Improved Belt Power Worm Geared Elevator No. 6



Similar to our No. 5 but designed for lighter work.

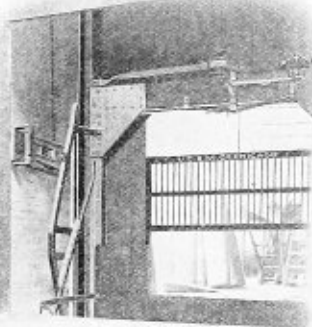
Speed 30 Feet Per Minute

Platform Made Any Size Wanted

Capacity 500 to 2000 Lbs.

"UNION" AUTOMATIC ELEVATOR SAFETY DEVICES

For Opening and Closing Elevator Gates, Doors and Hatch Bars



"Independent" Type
Showing Gate Open

"INDEPENDENT" TYPE No. 1

Patented

The device is simple in construction—Free from complicated or troublesome parts.

Any part of the mechanism that might require any attention in oiling, etc., is accessible from the floor of the car.

Pulleys are of large diameter and self lubricating bushed.

Prices

Independent Safety Device with operating cam, gate, pulleys, rope and guides. Per Floor.....\$25.00

In ordering be sure to state size of opening, height of floors and number of gates wanted.

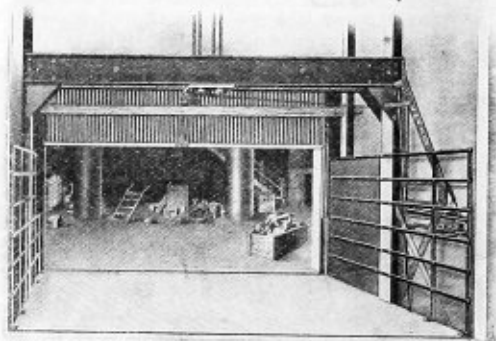
"OPTIONAL" TYPE No. 2

Patented

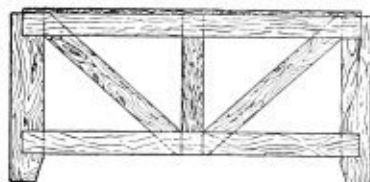
With this device the opening of gates is optional with the elevator operator. By the manipulation of a small lever, which is placed in a convenient position on the car, the operator has full control of the gates at all times, opening the gates only when desiring to stop the elevator at a floor, and closing same automatically when the car leaves the landing.

We have placed in successful operation many optional type devices for opening and closing Meeker Doors, Gates, etc.

Estimates furnished upon receiving specifications of sizes and number of doors.



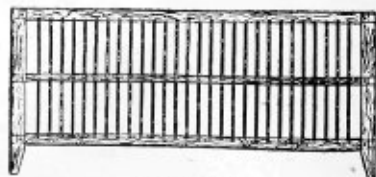
"Optional" Type No.

SAFETY ELEVATOR GATES

No. 1 Gate

Any Size

Write for Complete
Elevator
Catalog



No. 2 Gate

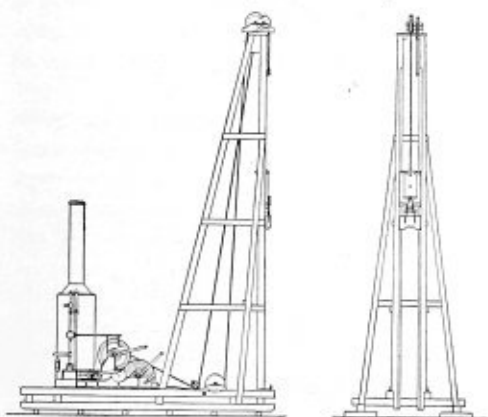
PILE DRIVING MACHINERY

We can furnish either iron work only, or iron work and woodwork complete, ready to set up. When a complete outfit is ordered we assemble the entire leaders in the shop, and when taking apart, mark all joints to facilitate erection in the field. The framework is of Norway pine, head-block of oak or maple, ladder rungs of turned oak, wedged in, and rollers of maple; all bolted together, no nails being used. Prices include painting and "knocking down" for shipment and delivery on cars, Chicago.

While only the "township" drivers are illustrated (see next page) as being suitable for operation by horse power, we occasionally arrange larger sizes for that method of hoisting. This would, of course, necessitate the use of nippers for the hammer and tackle blocks for the hoisting line.

STANDARD CONTRACTORS' PILE DRIVER

Operated by a Double Cylinder Double Patent Friction Drum Hoisting Engine



The cut illustrates a driver with extension sills, adapted to carry the engine. We make them either as shown or with shorter sills, for use when the engine is located elsewhere.

A full set of iron work usually consists of the following: hammer with round steel pin fitted in; top sheaves, shafts, boxes and bolts; bottom sheave, shaft, boxes and bolts; one pair each of No. 1 and No. 2 toggles, and channel iron liners with bolts and washers. When, as shown in cut, a pile cap is used, toggles are not required.

Contractors' Pile Drivers, Complete, Omitting Lines and Blocks

Size of Driver, pounds	Distance Between Jaws of Hammer, in inches	Width of Jaws of Hammer, in inches	Height of Leaders, in feet	Length of Channel Irons, in feet	Price of Iron Work Complete, Consisting of		Woodwork Complete, with Short Sills	Total Price of Complete Pile Driver with Short Sills	For Extension Sills add Extra
					Hammer with Steel Pin Fitted in; Top Sheaves, with Shafts, Solid Boxes and Bolts; Bottom Sheave with Shaft, Boxes and Bolts; Channel Iron Liners, with Bolts and Washers; One Pair each No. 1 and No. 2 Toggles with Bolts.				
1500	18	6¼	30	27½	\$115.80		\$180.00	\$295.80	\$30.00
1800	18	6¼	30	27½	124.80		180.00	304.80	30.00
2000	19	7¼	35	32	148.65		232.50	381.15	37.50
2500	19	7¼	40	37	169.65		315.00	484.65	37.50
3000	20	8¼	50	47	207.55		577.50	785.05	52.50

On outfits above 3,000 pounds, prices will be given upon application. When a pile cap is used No. 1 and No. 2 toggles are not required.

On the larger sizes of leaders, freight rates are liable to be prohibitory for long distances. We furnish working drawings for woodwork when iron work only is ordered.

Prices on hoisting engines, for operating above drivers (shown elsewhere), quoted upon application.

"TOWNSHIP" PILE DRIVERS



Usually Operated by Horse-Power, with Hammers that weigh from 500 to 1200 Pounds

In order to meet the demand for a Pile Driver for use on small bridges and other light driving, at reasonable cost, we are building them as shown in cut herewith. We make them from 500 to 1,200 pounds.

The hammer is usually raised by horse-power, the smaller sizes being hoisted direct, that is without a purchase block, and the larger sizes have one end of the line fastened to a suitable post, driven into the ground, while the other end is passed through a tackle-block, which is fastened to the main hoisting line and leads to the whiffle-tree direct. Sometimes contractors use a winch, which is bolted to the ladder. It, of course, will do the work, but is very slow. Tackle-blocks can also be used, instead of sheaves at top and bottom, on smaller sizes, when so desired.

The Pile Driver complete, in addition to the iron work below, consists of the framing as shown, fastened together with bolts so as to be readily taken apart for transportation, having turned ladder rungs, turned maple rollers, and a nipper block, but not including lines or adjustable trip. Prices include painting and delivery on car, "knocked down," Chicago.

A full set of ironwork usually consists of a hammer with steel die fitted in, nippers, top sheaves, shafts, boxes and bolts, one pair of No. 1 toggles with bolts, one pair of No. 2 toggles with bolts, channel-iron liners, with bolts and washers, together with working drawing of the woodwork when desired. Snatch-blocks at bottom we think are preferable to fixed sheaves for horse-power.

PRICES OF TOWNSHIP PILE DRIVERS COMPLETE, OMITTING LINES AND BLOCKS

Size of Driver, in Pounds	Distance between Jaws of Hammer, in Inches	Width of Jaws of Hammer, in Inches	Height of Leaders, in Feet	Length of Channel Irons, in Feet	Price of Iron Work Complete, Consisting of Hammer with Steel Die Fitted in; One Pair Forged Nippers without Block; Two Top Sheaves with Shafts, Boxes and Bolts; Channel Iron Liners with Bolts and Washers; One Pair Each No. 1 and No. 2 Toggles.	Price of Woodwork Complete	Total Price of Pile Driver Complete without Lines or Blocks
500	13	4 1/4	24	23	\$ 69.15	\$112.50	\$181.65
600	13	4 1/4	24	23	72.90	112.50	185.40
700	14	4 1/4	26	25	76.95	135.00	211.95
800	14	4 1/4	26	25	80.35	135.00	215.35
1000	16	5 1/4	28	26 1/2	103.15	150.00	253.15
1200	16	5 1/4	28	26 1/2	109.90	150.00	259.90

Lines and Blocks are extra, quoted upon request

PARTS OF PILE DRIVERS

DROP PILE HAMMERS



We aim to get the best form of hammers suitable for the purpose, and have given careful attention to three points, viz.:

1st. To get as much of the weight in the bottom of the hammer as possible.

2nd. To have the hammer as long as the size of the leaders will permit. This gives longer bearing in the guides.

3rd. To have as little play as possible between the hammer and the leaders. This is required to obviate as much as possible the jar on the leaders at the time of striking the pile.

We recess the pin in the body of the hammer, so as to take advantage of all the height of the leaders possible. All corners are rounded.

Bottoms when made concave are only slightly so—not over $\frac{5}{8}$ of an inch. When pile caps are used, however, there should not be any concave.

The Dies or Pins are made in three different styles:

1st. Triangular Die of hammered steel, fitted in the hammer, and stationary.

2nd. Rolling Die; a hammered steel triangular die rotating on a turned pin, which is fitted tightly in the hammer.

The above forms are used with nippers.

3rd. A Turned Steel Pin, to which the hoisting line is attached direct. This form is used where driving is done by friction. The hole in hammer is also finished, that is, bored out, to make a close fit.

Where Channel-iron Liners are used, $\frac{1}{4}$ of an inch play, that is, $\frac{1}{4}$ of an inch on each side, appears to be sufficient, but where Strap-iron Liners are used, $\frac{1}{2}$ of an inch should be allowed.

Sizes of Hammers

Weight of Drop Hammer, Pounds	Distance Between Jaws, Inches	Width of Jaw, Channel-Iron Liners	Width of Jaw, Strap Liners
500 and 600	13	$4\frac{1}{2}$	$4\frac{1}{2}$
700 and 800	14	$4\frac{1}{2}$	$4\frac{1}{2}$
1,000 and 1,200	16	$5\frac{1}{2}$	$5\frac{1}{2}$
1,500 to 1,800	18	$6\frac{1}{2}$	$6\frac{1}{2}$
2,000 to 2,500 inclusive.	19	$7\frac{1}{2}$	$7\frac{1}{2}$
Over 2,500	20	$8\frac{1}{2}$	$8\frac{1}{2}$

Prices of Hammers

Weight of Hammer in Pounds	Price Per Pound	Extra for Triangular Die Fitted in Hammer	Extra for Steel Turned Pin Fitted in Bored Hole
600 and under	\$.05	\$2.50	.....
700 to 800 inclusive....	.04 $\frac{1}{2}$	2.50	.....
1000 and under 1500....	.04 $\frac{1}{2}$	3.00	\$4.00
1500 and under 3000....	.04	5.00	5.00
3000 and over .....	.03 $\frac{1}{2}$	.....	6.00

Rolling Triangular Dies are very seldom called for, but can be furnished at from \$4.00 to \$8.00, according to size of hammer.

NOTE.—Weight will vary 25 to 100 lbs. more or less, than ordered weight, depending on size of hammer



With Block



Nippers

Without Block

The general use of friction engines for driving piles has done away, to a large extent, with the demand for Nippers. The larger sizes are seldom called for. We have added to our list a smaller size for very light hammers. Our Nippers are forged out under a steam hammer and have machine-finished hinges and steel plated points. **We set the arms to suit width between the leaders, which should be sent us.**

The Nipper Blocks are of oak, well bolted, the No. 1 size having a wrought iron strap through which the pin passes.

No.	Suitable for Hammers	Price of Nippers, Only	Nipper Blocks Extra
1	2500 lbs. and up ..	\$47.00	\$9.00
2	1500 to 2000 lbs. . .	36.00	8.00
3	1000 to 1200 lbs. . .	28.00	6.50
4	800 lbs. and under	21.00	6.50

Adjustable Trips



The Adjustable Trip is used for striking light blows, such as needed for a pile of small diameter, or for pile very near its destination. It is raised or lowered in the leaders by means of a small line, with suitable sheave at the top. The sides are of plate iron, the striking plates at the ends of cast iron, to give the necessary weight, while the bail is of wrought iron. We make them of three sizes, of the dimensions to suit leaders.

No.	Suitable for Hammers	Price, Each
1	2500 lbs. and over	\$32.00
2	1200 to 2000 lbs.	22.00
3	1000 lbs. and under	17.50

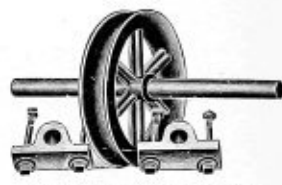
PILE-DRIVER SHEAVES

**No. 1. Top Sheaves**

With solid, bored out boxes, having holes on top for grease or oil cups, which are extra.

**No. 2. Top Sheaves**

With open boxes to receive oily waste; babbitted on lower half.

**No. 3. Bottom Sheave**

Runs loose on shaft. Boxes furnished with set screws. Sheave Com. or S. L. bronze bushed.

The No. 1 top sheaves are much preferred, as with the grease or oil cups they save considerable going up and down for examination and oiling; cups are extra and four are needed for each set of two top sheaves; select style wanted from other section of catalog. All sheaves have deep and smooth grooves; top sheaves are pressed tight on shafts. Bottom sheave may be provided with a wooden box, or housing, to prevent line from jumping off when slack. Diameters of these sheaves are measured from the bottom of the grooves. A set of Pile Driver Sheaves consists of two top sheaves, one for hammer line, the other for pile line, both with shafts, boxes and bolts, and one bottom sheave with boxes and bolts.

Suitable for Hammers	Hammer Line Sheave			Pile Line Sheave			Bottom Sheave			Prices, with Shafts, Boxes and Bolts		
	Diam.	Diam. Shaft	Rope, up to	Diam.	Diam. Shaft	Rope, up to	Diam.	Diam. Shaft	Rope, up to	No. 1 Top Sheaves	No. 2 Top Sheaves	No. 3 Bottom No. Housing
500 to 800 lbs.	9 in.	1 1/8	1 1/4 in.	6 in.	1 1/8	1 in.	12 in.	2 1/8	1 1/2 in.	\$ 9.50 Pair	\$12.00 Pair	\$11.00 Each
1,000 to 1,800	12 in.	1 1/2	1 3/4 in.	9 in.	1 1/2	1 1/4 in.	16 in.	2 1/2	1 3/4 in.	\$13.50 Pair	\$16.00 Pair	\$15.50 Each
2,000 & over	16 in.	1 3/4	2 in.	12 in.	1 3/4	1 1/2 in.	20 in.	2 3/4	2 in.	\$18.00 Pair	\$21.00 Pair	\$21.00 Each

Grease or oil cups are extra. If wanted for wire lines be sure to so state.

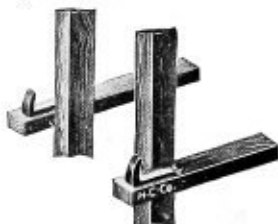
LINDSLY PILE-DRIVER HEAD-BLOCK

The inclined guide rollers permit the pile line to lead out in any direction without extra friction or wear, and the entire Head-block is so constructed that the lines cannot run against any sharp angles, nor can they be displaced from the sheaves in service.

Easily set in place, is durable and easy running, as the sheaves are pressed on shafts which turn in babbitted boxes.

Price, \$100.00

TOGGLE IRONS

**No. 1****No. 2**

Weight of Drop Hammer, Lbs.	No. 1 TOGGLES		No. 2 TOGGLES	
	Opening	Price	Center of Leaders to Hooks	Price
500 to 800	13 inches	\$ 8.50	6 1/2 inches	\$2.60
1,000 to 1,200	18 inches	13.50	9 inches	4.80
1,500 to 2,500	22 inches	16.50	11 inches	6.50
Over 2500	26 inches	21.00	13 inches	8.00

Prices given above are per pair, including necessary bolts.

CHANNEL IRON LINERS

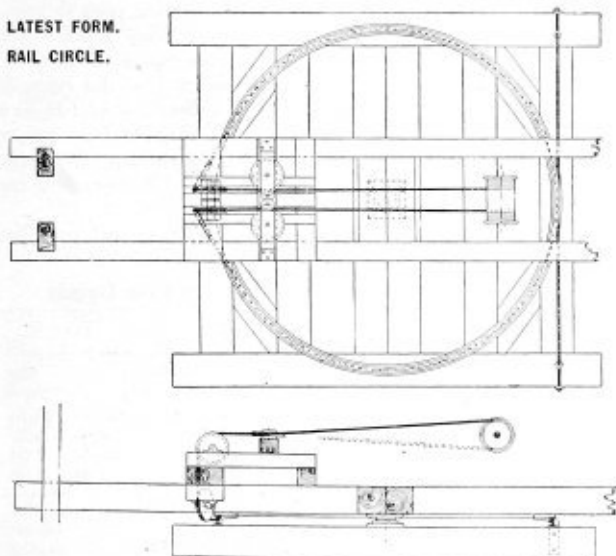
These are the wearing irons placed on the inside of the leaders, between which the hammer operates.

We can often furnish them as long as 60 feet, but not always. It is well to avoid joints if possible, but the necessities of shipping require us to cut them into short pieces, say 20 feet and upward, depending on size of cars, whether box or flat cars, etc., and joining them together with splice plates.

We make the bolts of varying lengths, to suit the taper of leaders, hence the height and thickness at top and bottom of leader timbers must be sent when ordering.

Prices below are for Liners, drilled and counter-sunk, including C.S. head-bolts, nuts and washers:
4-inch, per foot...\$0.48 | 5-inch, per foot...\$0.56 | 6-inch, per foot...\$0.68 | 7-inch, per foot...\$0.80 | 8-inch, per foot...\$0.96
Double above price to get running foot of leaders.

No. 1 TURNTABLES — FOR SWIVEL PILE DRIVERS

LATEST FORM.
RAIL CIRCLE.

One important improvement in modern swivel pile drivers is the substitution of sliding contact for rollers or wheels. With wheels there was a great liability, when the driver frame was out of level, of turning very abruptly and unexpectedly, causing oftentimes great damage. A sliding contact, however, while somewhat more difficult to move, is much safer. It is self-contained on the frame. It is not necessary to lead ropes to stakes or other hold-fasts outside of the frame. It is under instant control of the operator. The driver is held at any point, even if inclined.

The outfit consists of sixty-pound rail bent to a circle of the diameter required, varying from ten to sixteen feet, in halves, spliced on under side, and provided with countersunk bolts to hold down; six wrought iron shoes made in two pieces, riveted together, the upper part acting as a sliding piece on the top of the rail and the lower part as a clamp under the head of the rail; top and bottom center castings; four sheaves, shafts and boxes for leading the rope; two sheaves in wrought iron frames, on deck, to keep rope fair. An engine with reversing drum should be used, or a reversing engine with an extra drum.

The wire rope is fastened to the opposite sides of the bed frame, in the rear, with long threaded bolts (to allow of taking up the stretch of the rope), led around the rail under the head, then through the sheaves to the drum.

The diameter of the circle will depend on the weight of the hammer and height of the leaders.

Prices of turntables:	10-foot diameter	\$150.00
	12 " "	156.25
	14 " "	162.50
	16 " "	168.75

Leading Rollers and Frame, for above, \$9.00

SIZES OF MANILA LINES OR ROPES FOR HAMMERS

Sizes of Manila Lines for Drop Hammers:

Size,	500 lbs.	Hammer lines,	$\frac{7}{8}$ -inch.	Pile lines,	$\frac{1}{4}$ -inch
"	800	"	1	"	$\frac{7}{8}$
"	1,000	"	1 $\frac{1}{8}$	"	1
"	1,200	"	1 $\frac{1}{8}$	"	1
"	1,500	"	1 $\frac{1}{4}$	"	1 $\frac{1}{8}$
"	1,800	"	1 $\frac{1}{2}$	"	1 $\frac{1}{8}$
"	2,000	"	1 $\frac{1}{2}$	"	1 $\frac{1}{4}$
"	2,500	"	1 $\frac{3}{4}$	"	1 $\frac{1}{2}$
"	3,000	"	2	"	1 $\frac{3}{4}$

Smaller sizes can be used but, of course, are not so durable.

Steam Hammers Require

No.	size.	Hammer lines,	2 -inch.	Pile lines,	1 $\frac{1}{4}$ -inch
No. 1	size	"	1 $\frac{1}{4}$	"	1 $\frac{1}{4}$
No. 2	size	"	1 $\frac{1}{2}$	"	1
No. 3	size	"	1	"	$\frac{1}{4}$

For hammer lines a 4-strand pure manila rope is used and either a 3 or 4-strand rope may be used for pile line.

Sometimes a wire hammer line is required; we furnish a crucible steel wire rope of 6 strand, 19 wire construction, $\frac{3}{4}$ for No. 1 and $\frac{5}{8}$ for No. 2 size.



"AJAX" Highest Quality Long Fibre Pile Driving Rope

Our Ajax rope (fully described elsewhere) is the strongest, safest and most economical manila rope for driving. It is 75% stronger than 1st quality pure manila rope and will last over twice as long.

Pile Points or "Shoes"



	Weight, Lbs.	Price, Each
4 in. x 4 in. square.....	15	\$.75
5 in. x 5 in. square.....	20	2.00
6 in. x 6 in. square.....	35	2.30



9 in. x 2½ in.....	17	\$1.70
9 in. x 3 in.....	25	2.00
9 in. x 3½ in.....	33	2.50



6 in. round.....	35	\$2.30
8 in. round.....	78	4.50
10 in. round.....	150	7.00

All sizes are measured on the upper, or bearing, end.

Of course, these sizes will do for piles of much larger size, as the piles should be tapered to fit in straps.

Spikes are included in prices.

No. 2 Sheet Pile Caps, or Followers Open End

For driving steel and wooden sheeting, open end.



This is similar to follower casting for round piles, arranged for driving wooden sheeting. When ordering specify the outside rectangular dimensions of pile.

For 3 x 12 sheet pile.....	\$ 8.00
For 4 x 12 sheet pile.....	12.00
For 6 x 10 or 12 sheet pile.....	15.00
Other sizes to special order.	

Pile Bands



When driving piles in hardpan with a drop hammer, the head of the pile is liable to be broomed up by the repeated blows of the hammer. In such cases Pile Bands or Rings of wrought iron can be fitted to the pile and removed when driven. We make them only to order, and recommend Norway Iron for this purpose.

We make them ordinarily of ¾x3 inch iron, but list other sizes as well.

Imported Norway Iron Pile Bands

Size of Irons, Inches	Diameter in inches.					
	11	12	13	14	15	16
¾ x 3	\$4.00	\$4.50	\$5.00	\$5.30	\$5.70	\$6.10
1 x 2½	4.20	4.70	5.30	5.60	6.00	6.50
1 x 3	4.50	5.00	5.50	6.00	6.50	7.00
1 x 4	5.50	6.00	6.60	7.20	8.00	9.00

Any size at short notice.

Pile Head Covers



To protect pile heads from the weather, and at the same time serve as a very good advertisement. Name will be cast in on order of two dozen or more. Holes are drilled in sides and countersunk. We have patterns for 11½ and 13½ inches diameter, 11½ inches diameter.....Price \$1.20 each 13½ inches diameter.....Price 1.50 each

No. 6 Swiveling Bottom Sheave



For use at bottom of leaders, for hammer line. It will follow the lead of the line and is well adapted for horse-power or whenever the hoisting line cannot be led in line with a rigid sheave.

Sheave 12 inches diameter.....	\$33.00
Sheave 9 inches diameter.....	26.00

State thickness of timber for bolt and whether for manila or wire rope.

Pile Band Puller, Forged, Not Cast Steel



Hook adjustable for different sizes of bands.

Price \$12.00



**Pile
Pulling
Chains**

Made of our "Bullock" highest quality dredge chain. Prices quoted upon receipt of sizes. Timber or dock clamps will be found listed elsewhere.

ROLLER SPOOLS AND AXLES



No. 1. Square Shaft

Spool is machine finished; to run on 10-inch wooden or 10-inch iron pipe rollers. We can furnish also the 10-inch oak rollers, 26 feet and under, banded on ends and drilled for crowbar. Four roller spools and two oak rollers make one set.

No. 1. Square Shaft..... per set of four, \$124.00
No. 2. Round Shaft, very heavy " " 280.00

Two Oak Rollers, 10-inch by 26 feet, banded and drilled.....\$130.00
Two Oak Rollers, 10-inch by 24 feet, banded and drilled..... 124.00
10-inch diameter Pipe Rollers quoted upon request. State length wanted.

ROLLERS

RIGID ROLLER BEARINGS



These are plain castings to take the place of the spool rollers shown to the left. Instead of rolling they slide on the long rollers. With pipe rollers they are also satisfactory. Our pattern is for 10-inch pipe, about 10½ inch diameter, and also for 10-inch diameter oak rollers. Specify when ordering which is to be used.

Rigid Roller Bearings.

Per set of four.....\$46.00
Price, each..... 11.50

PILE SAW ARBOR

For Cutting Off Piles Under Water

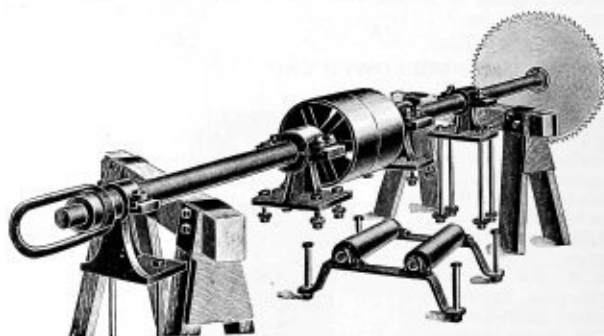
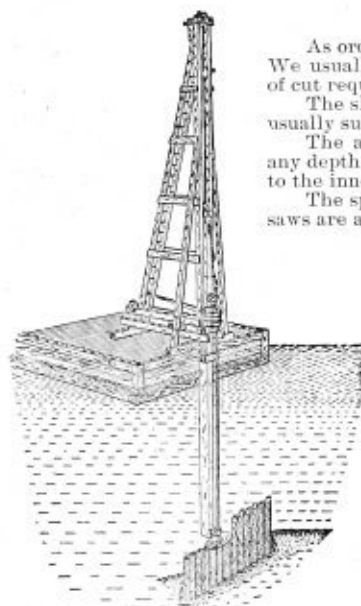
As ordinarily used they are made to cut off piles 16 to 24 feet under water. We usually allow for 8½ feet in length above water, to which we add the depth of cut required to get length of arbor.

The shaft is 3⅞ inches in diameter, and counterbalanced. A 42-inch saw is usually sufficient, but for very large piles this size would have to be increased.

The arbor works on a spline its entire length, and is readily adjustable to any depth within its range. Side rollers and frames are furnished, to be fastened to the inner side of leaders, for the belt to run on.

The speeds and approximate horse powers required for different diameters of saws are as follows:

36-inch saw,	700 R. P. M.,	8 H. P.
42 " "	600 " "	10 " "
48 " "	525 " "	12 " "

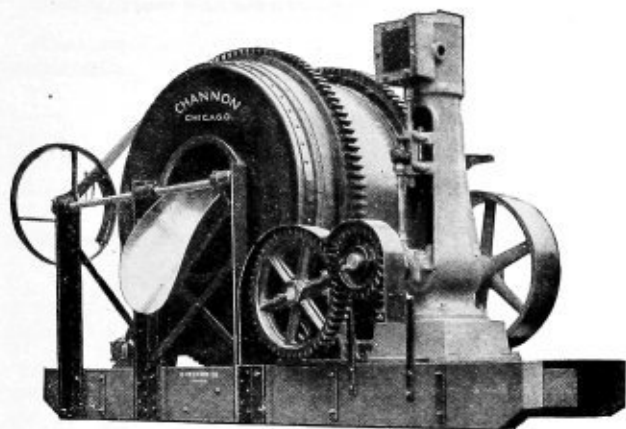


Our price includes the saw, arbor, pulley bearings, sheaves, swivel hook, counterbalanced sheave, side frames and rollers, with necessary bolts to fasten all to woodwork, together with a drawing for the woodwork and fastening in place.

Our regular pile driver engines can be fitted with an attachment for driving the saw. When this feature is desired we cast the frame with an extension on the front end to carry an extra shaft, driven by a pinion from the front drum shaft; this shaft carries a pulley in the center of the engine and from which the pile saw arbor may be driven direct. Price of Pile Saw Arbor, regular 28½ feet.....\$380.00

For increase or decrease in length, prices quoted upon application.

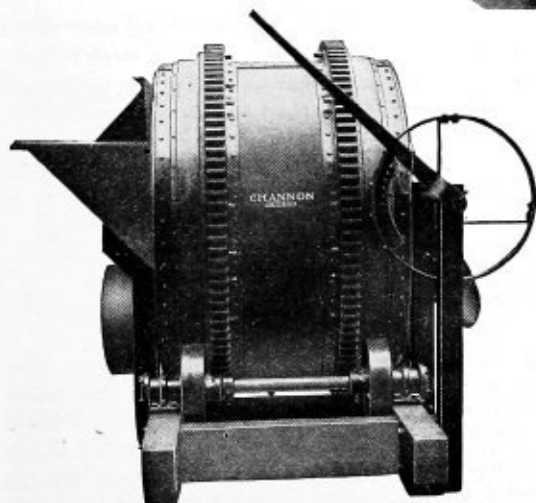
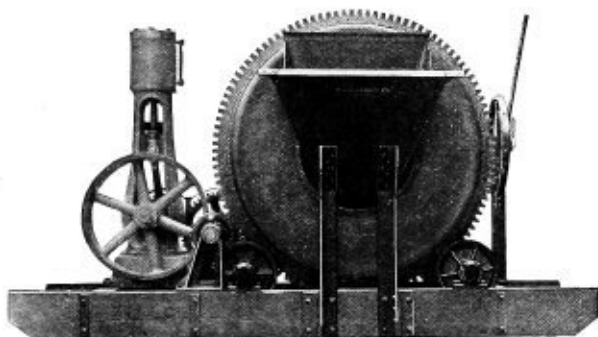
THE CHANNON CONCRETE MIXER



DISCHARGE VIEW

Mixer Connected to Engine and Mounted on Skids

FEED SIDE
Mixer Connected to Engine and Mounted on Skids. Note the large Feeding Chute



**FEED CHUTE AT LEFT-DISCHARGE
SPOUT AT RIGHT**

Mixer on Skids, with Belt Pulley at Left

THE CHANNON CONCRETE MIXER

A simple and efficient Machine for thoroughly mixing concrete and mortar

FEATURES

Thorough Mixing

Low Charging

Strongest Construction

No Complicated Devices

Straight, Not Beveled Gearing

Sectional Drum Gears

Dust-Proof, Bronze-Bushed, Chain-Oiling, Reservoir Bearings

Rapid Mixing

Non-Tilting

Smooth-Running

Rapid Discharge

Ample Power

Improved Mixing Blade

Recognizing the severe demands made on Concrete Machinery in service, our aim has been to produce a mixer that would be strong, simple and capable of mixing concrete thoroughly and cheaply without constant attention and repairs.

The Channon Mixer consists of a steel drum, revolving upon four rollers and driven by two gear rings, and two pinions, insuring bearing alignment and traction for rollers, overcoming spring and uneven wear.

When mixing, this drum revolves continuously. The materials are fed in at one side and discharged at the other by simply lowering the mouth of the discharge apron or chute. The drum is not tilted to discharge contents.

The wide-flanged bands or rings on drum, forming track for rollers, are extra heavy and chilled on both face and flange; the gear rings are made in segments or sections and bolted to the flanged bands, so that if any teeth are broken in transit or by accident, only one segment need be replaced which is quickly and easily done by use of a wrench. This feature is possessed by no other mixer and is thoroughly appreciated. We know of many cases where gear rings have been broken and the machine put out of commission until a new gear ring could be obtained from the factory and put on with the greatest difficulty. On some machines it would be necessary to cut off every rivet besides taking off drum head before the old gear ring could be removed.

Combining heavy sheet steel plates with the wide roller bands gives us the strongest drum on the market.

The drum rollers have wide chilled faces, and long hubs, and are key-seated to their shafts which revolve in the finest bearings or journals ever put on a concrete mixer.

Bearings:—Great trouble has been experienced in the past with bearings cutting out on account of the dust and grit from the materials to be mixed: i. e., stone dust, cement and sand, all good CUTTING mediums.

To overcome this difficulty we are now placing on our machines a dust-proof, bronze-bushed, chain-oiling bearing, with reservoir containing sufficient oil to last nearly a month without refilling or other attention.

The "Feed Chute" is of ample size, the full load of a barrow can be dumped into it without spilling.

There are no movable parts within the drum. The mixing blades—or really scoops—are a decided improvement over anything heretofore offered.

The shape and method of placing the scoops, combined with the rotation of the drum, turn the materials over upon themselves, elevating them to the top of the drum from whence they fall to the bottom again by gravitation, moving from side to side, with a shoveling, kneading and grinding motion, resulting in a quick, thorough and uniform mixture several times per minute.

The discharge is effected by simply lowering the mouth of the discharge chute, operated by one quick motion of the lever—a barrow may be loaded and the discharge stopped instantly by reversing this lever.

THE SMITH CONCRETE MIXER

A "Batch" Mixer, Fed and Discharged by Tilting While Running



The above illustration shows the standard outfit for general contract work, i. e., mixer direct connected to vertical steam engine and boiler, all complete and mounted on trucks for transportation.

Also furnished with steam engine only, gasoline engine, or motor, or with belt pulley, and with or without trucks.

The machine consists of a drum of double conical form, supported and guided by a frame, which can be tilted at will while the drum is revolving. The materials to be mixed are fed in at one end of the drum, and when mixed are discharged at the other end by tilting the drum while running at full speed. The interior of the drum is provided with rigid blades, arranged in sets, each set forming a "shingled" spiral. The alternate sets are of reversed winding, and overlap each other in the middle of the drum.

Sizes and Capacities

Six sizes of power-driven machines are now offered to the trade. These sizes handle batches based on even bags of Portland Cement as follows:

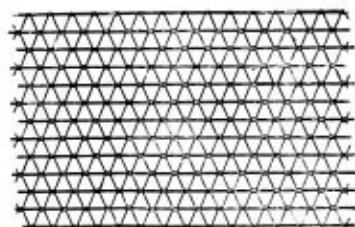
- No. 0 —Will usually require the cement to be measured.
- No. 1 —Any proportions with one bag of Portland Cement.
- No. 2 —Any ordinary proportions with two bags of Portland Cement.
- No. 2½ —Any proportions with two bags of Portland Cement.
- No. 4 —Any proportions with three bags of Portland Cement.
- No. 5 —Any proportions with four bags or one barrel of Portland Cement.

A batch every two minutes may be obtained when the mixer is fed with wheelbarrows. If batch feeding hopper, or dump cars are employed for feeding, a batch every minute is possible. Still better results have been obtained by using a measuring hopper filled from storage bins.

Size Number.....	No. 0	No. 1	No. 2	No. 2½	No. 4	No. 5
Standard charge cubic feet {						
Cement.....	1	1	2	2	3	4
Sand.....	2½	4	6	7½	10½	14
Stone.....	5	8	12	15	21	28
Total unmixed per batch.....	8½	13	20	24½	34½	46
Mixed material per batch (loose).....	6	9	13½	16½	22	30
Cubic yards mixed per hour, up to.....	9	20	30	39	46	62
Power required—H. P.....	4	6	8	10	15	19
Revolutions per minute of driving pulley.....	218	180	173	162	160	125
Diameter and face of driving pulley.....	20x4½	24x5½	28x5½	28x6½	36x6½	48x7½
Weight on skids with pulley only.....	1,600	2,500	3,800	4,500	5,600	7,300
Weight on truck with pulley or gears.....	2,100	3,000	4,400	5,500		
Weight on truck with steam engine and boiler.....	3,100	5,000	7,400	8,400		
Weight on truck with gasoline engine.....	3,600	5,000	7,000	8,500		

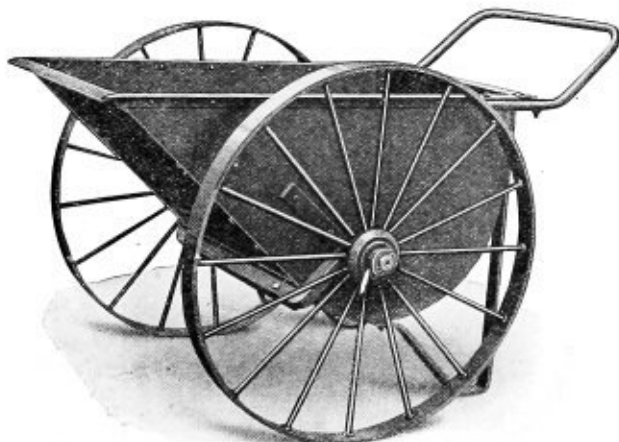
STEEL BARS FOR REINFORCED CONCRETE

We can supply round, plain and twisted square bars of high tensile strength, ample ductility and high elongation. In asking for prices be sure to specify what is wanted, giving quantity, sizes and lengths.

**STEEL WIRE REINFORCEMENT**

Built up of either stranded or solid longitudinal or tension members, with the cross or bond wires arranged or running diagonally across the width of fabric. This arrangement affords the most even distribution of the steel, reinforces in every possible direction and provides the most ideal mechanical, as well as adhesive bond, between the steel and concrete.

Send for catalog giving weights, areas, bending moments and tensile strengths.

No. 3 CONCRETE CART

Capacity 6 cubic feet of thin, sloppy concrete, or 7 cubic feet of dry material. Laborer can transport about three times more than with wheelbarrow.

Tray is 14 gauge steel with forged corners and reinforced with angle iron entirely around the top edge. Legs are of heavy steel, wheels are roller bearing, 30 in. diameter, 2-in. tires, with wrought iron hubs; axles, 1¼-inch diameter.

Weight, 200 lbs. Price \$30.00 each.



THE "BUCKEYE" PORTABLE LIGHT

Adopted by Panama Commission

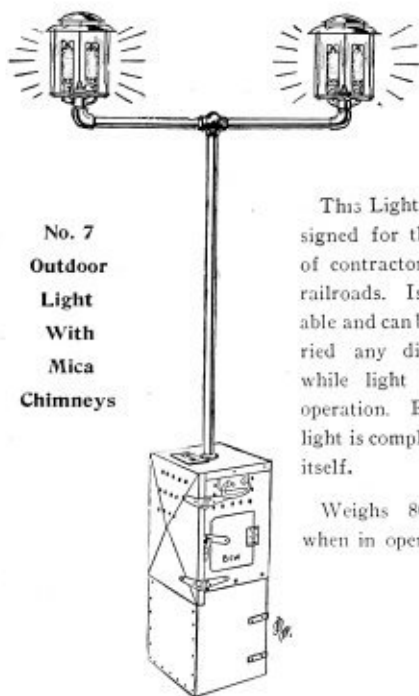
For outside work. Used by railroads, contractors, miners, dredgers, etc. Unaffected by wind or rain. Casts no strong shadows.

It is a portable light torch, having the power within itself generated from kerosene oil forced by compressed air to a burner which is heated by a simple process before the oil is turned on. When turned on it at once becomes vaporized and sends forth a strong, white, smokeless flame 12 to 40 inches long, depending upon the size of the lamp.

Size Number	List Price	Candle Power	Size of Tank	Oil Consumed per Hour	Weight, Boxed	Extra Burners
3	\$ 90.00	2000 to 2500	18 x 27 in.	1 1/4 gallons	200 lbs.	\$16.50
5	96.00	4000	18 x 27 "	1 3/4 "	200 "	24.00
2A	75.00	2000	16 x 22 "	1 1/4 "	160 "	16.50
Jumbo	150.00	5000	24 x 32 "	2 "	320 "	36.00

The No. 3 is the most popular size for all purposes. More of this size sold than any other.

B & W GASOLINE LIGHTS



No. 7
Outdoor
Light
With
Mica
Chimneys

This Light is designed for the use of contractors and railroads. Is portable and can be carried any distance while light is in operation. Each light is complete in itself.

Weights 80 lbs. when in operation.

Consumes one gallon of gasoline in 5 hours; spread of rays 100 feet square.

No. 7, price complete, \$75.00



No. 99
Portable
Search Light

Next to an electric search light this is the most powerful light ever invented.

It produces 12,000 candle power of light and will throw the light 500 feet. For wrecking crews, fire departments, steamboats and all kinds of outdoor work.

Absolutely weather proof.

Consumes one gallon of gasoline in 6 hours.

Height 3 1/2 ft. Weight 80 lbs.

No. 99, price complete, \$125.00

WHEN WRITING FOR PRICES ON DERRICKS BE SURE AND GIVE ALL THE INFORMATION REQUESTED BELOW

It will Save Trouble and Time

Quote price on.....Derrick similar to
 No.....page.....the heaviest load to be..... tons.
 Length of boom will be.....feet. Size of mast timber will be..... inches square.
 Name price including { Hoisting Engine
 { Horse Power
 { Hand Power Crab
 { Boom and Fall Ropes
 { Guys
 { Cross out what you don't want
 We will use { Say whether
 { Hand Power
 { Horse Power
 { Steam Power or
 { Electric Power } power.
 Derrick is to be used for.....
 Unusual conditions if any.....
 Changes if any.....

Under no circumstances do we guarantee Derrick Irons or Machinery unless specifically agreed upon in writing. Any parts proving defective will be replaced, provided they are tested immediately after delivery and notice of defects given us promptly; but in no case do we assume responsibility for any delay or damage.

BUSHING OF SHEAVES



Wire Rope Sheave
with "Common Iron" Bushing



Channon Self-Lubricating Graphite
Bronze Bushing

**"REQUIRES NO OIL
or ATTENTION"**

**5 Per Cent Less Friction
for Each Sheave**



Wire Rope Sheave with
Our Self-Lubricating Bushing

"COMMON IRON BUSHING"

This in reality is no "bushing" at all, as it consists of a sheave with a plain bored hole revolving on a steel pin or shaft. The wear is in the hub of the sheave which soon necessitates a new sheave, requires constant attention and copious oiling.

CHANNON "SELF-LUBRICATING GRAPHITE BRONZE BUSHINGS"—No Oil Required

This "bushing" is a casting made of hard phosphor-bronze metal (which in itself has lubricating properties), having holes bored through it.

These holes are filled with a special graphite or plumbago lubricant and then baked under intense heat. Each bushing is baked four times, or until perfect, as the heat causes the lubricant in the holes to shrink, necessitating refilling and baking until both metal and lubricant are flush and smooth.

These bushings are then pressed into the sheaves by hydraulic pressure. They absolutely do not require any oil or attention; when a bushing is worn out another can be obtained at small cost. It is not necessary to buy a complete new sheave. Long actual experience and tests have demonstrated that this is the only perfect bushing for hard and quick work under all conditions. Ball bearings, rollers and other devices have been tried without success, as the great strains crush the balls and rollers where they do not rust out.

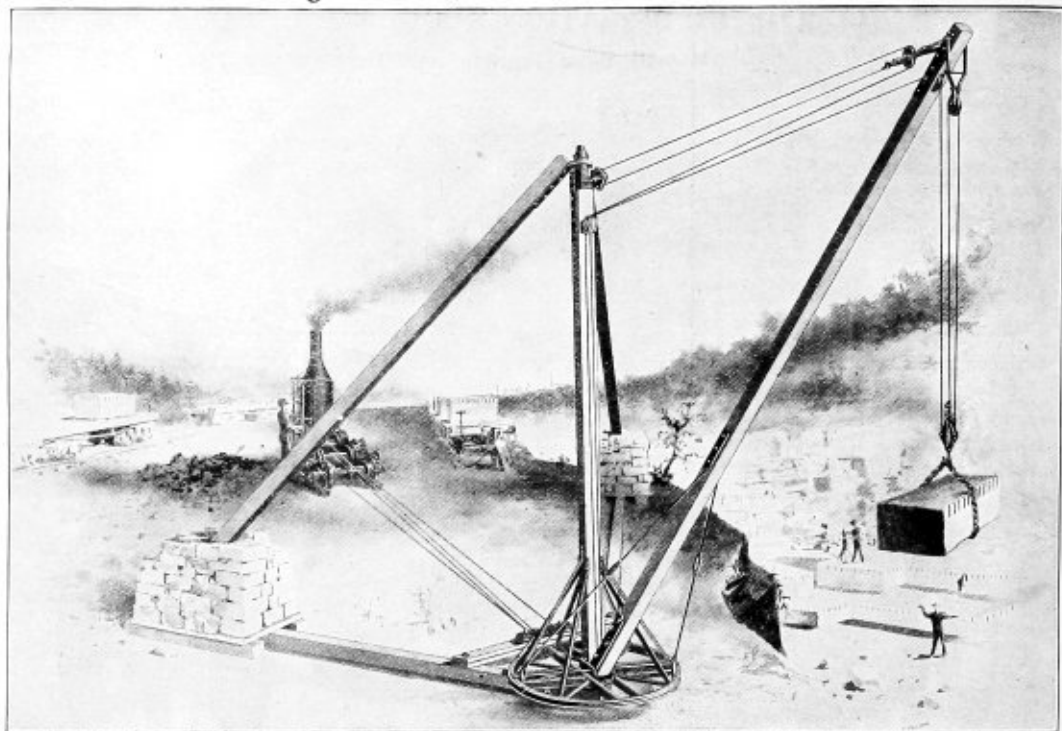
Tests with common bushings have shown a loss of power through friction to be over 12 per cent of the weight carried by each sheave.

The same tests have shown a loss of only 5 per cent for each sheave when our self-lubricating bushings were used.

"Will Outwear All Other Forms of Bushings"

These bushings can be used on all kinds of bearings

No. 3 POWER STIFF-LEG DERRICKS



With the outfit shown above, consisting of our special reversing Friction Swinging Engine and Bullwheel derrick the engineer can raise the load and swing it into place, in the same time it would take to do the lifting only with a double drum engine. When used with a double drum engine the bullwheel is omitted.

Booms can be $1\frac{1}{2}$ times the length of mast and even longer, of course the longer the boom the less load the derrick will safely handle. The boom and hoist lines after passing through the sheaves attached to face of mast, run downward through the double sheaves in mast step.

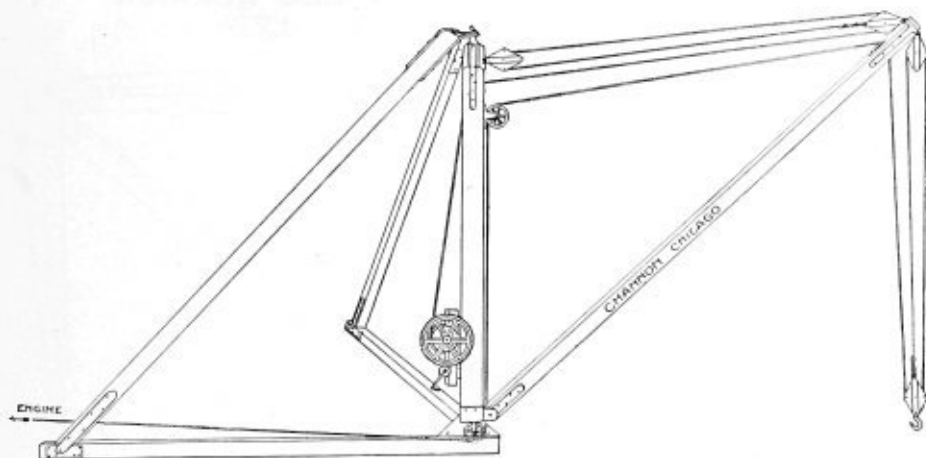
PRICE LIST

Without Timber, Engine, Bullwheel or Wire Rope

Size of Mast Timbers Boom, Stiff-Legs and Sills	Size, Inches	8x8 6x6	10x10 8x8	12x12 10x10	14x14 12x12	16x16 14x14	18x18 16x16
Capacity as Usually Rated,	Tons	1 to 2	3 to 5	6 to 8	10 to 12	15	20 to 25
1—Fig. 720. Mast Top Casting with gudgeon pin and cap, straps to mast and bolts.....		\$14.00	\$15.00	\$19.00	\$25.00	\$51.00	\$64.00
1—Fig. 750. Mast Bottom Casting with double sheave step, shafts straps to boom and bolts.....		18.00	22.00	34.00	46.00	73.00	95.00
1—Boom Point as shown with plates, straps, 3 sheaves, shafts and bolts.....		27.00	28.00	32.00	36.00	38.00	52.00
1—Fig. 855. Double Sheave Mast Bracket with bolts.....		6.60	6.60	7.60	8.60	10.00	14.00
2—Fig. 805. Top Stiff-Leg Irons or Goose-Necks with bolts.....		20.00	23.00	28.00	33.00	48.00	72.00
2—Fig. 810. Lower Stiff-Leg Irons with bolts.....		13.00	14.00	16.00	20.00	30.00	60.00
1—Single Block with 4 links of chain for mast head.....		6.65	8.00	12.00	20.65	23.00	28.00
1—Single Block with swivel hook or shackle for hoist fall.....		6.65	8.00	12.00	20.65	23.00	28.00
4—Union W. R. Clips.....		.64	.75	.75	.85	.85	1.05
2—Galv. W. R. Thimbles.....		.12	.15	.15	.16	.16	.21
Total with Plain Sheaves.....		\$112.66	\$125.50	\$161.50	\$210.91	\$297.01	\$414.26
Add for Self-Lubricating Bronze Bushed Sheaves....		15.00	15.00	16.50	21.00	25.00	34.00
		\$127.66	\$140.50	\$177.00	\$231.91	\$322.01	\$448.26

For greater purchase deduct Single Blocks mentioned and add blocks desired—see index for blocks.

No. 2 COMBINED HAND AND POWER STIFF-LEG DERRICK



The hoisting line of this derrick can be operated by a single friction drum hoisting engine or one of our horsepower hoisting machines listed elsewhere.

The above outfit is shown with a single drum wire rope winch operating the boom line.

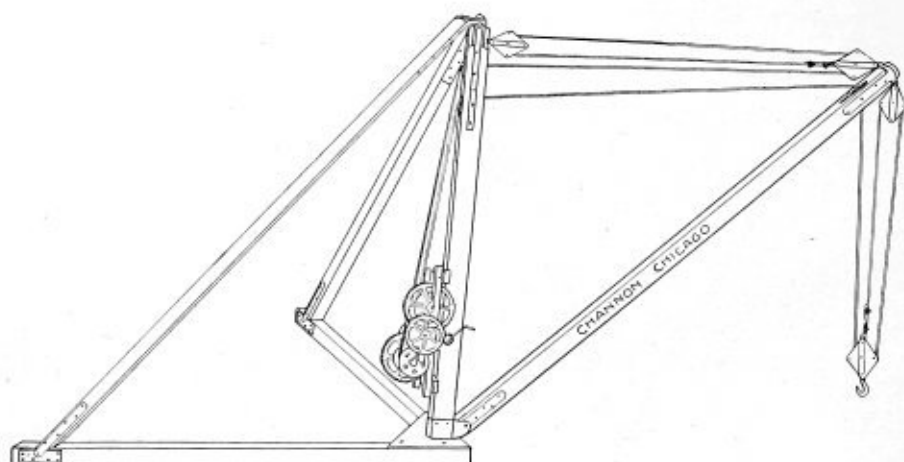
Where the boom is only raised and lowered occasionally manila rope may be used for boom line and fastened to cleat at back of mast.

This style of derrick should not be used with a very long boom.

PRICE LIST—Without Timber, Winch or Wire Rope

Size of Mast..... Timbers Boom, Stiff-legs and Sills..... Capacity as usually rated.....	Size, Inches..... Tons	8x8 6x6 1 to 2	10x10 8x8 3 to 5	12x12 10x10 6 to 8	14x14 12x12 10 to 12	16x16 14x14 15
1 Fig. 725, Mast Top Casting, but with only one Sheave.....		\$18.25	\$19.50	\$24.25	\$30.00	\$62.50
1 Fig. 750, Mast Bottom Casting, but with only one Sheave....		16.25	20.00	31.25	42.00	67.50
2 Fig. 805, Top Stiff-leg Irons, or Goose-necks, with Bolts....		20.00	23.00	28.00	33.00	48.00
2 Fig. 810, Lower Stiff-leg Irons, with Bolts.....		13.00	14.00	16.00	20.00	30.00
1 Fig. 855, Single Mast Sheave.....		4.50	5.00	6.00	7.00	8.75
1 Fig. 790, Boom Band.....		3.60	4.40	6.00	7.00	9.00
1 Boom Point Sheave and Shaft.....		1.75	2.00	2.75	4.00	5.50
1 Single Block, with four Links of Chain for Mast Head.....		6.65	8.00	12.00	20.65	23.00
2 Single Blocks, no hooks, for point of Boom.....		10.65	12.80	19.20	33.07	36.80
1 Single Fall Block, with Swivel Hook.....		6.65	8.00	12.00	20.65	23.00
5 Union W. R. Clips.....		.80	.95	.95	1.05	1.05
2 Galv. W. R. Thimbles.....		.12	.15	.15	.16	.16
Total, with Plain Sheaves.....		\$102.22	\$117.80	\$158.55	\$218.58	\$315.26
Add for Self-Lubricating Bronze-Bushed Sheaves.....		16.00	16.00	16.50	22.75	26.50
		\$118.22	\$133.80	\$175.05	\$241.33	\$341.76

No. 1 HAND POWER STIFF-LEG DERRICK



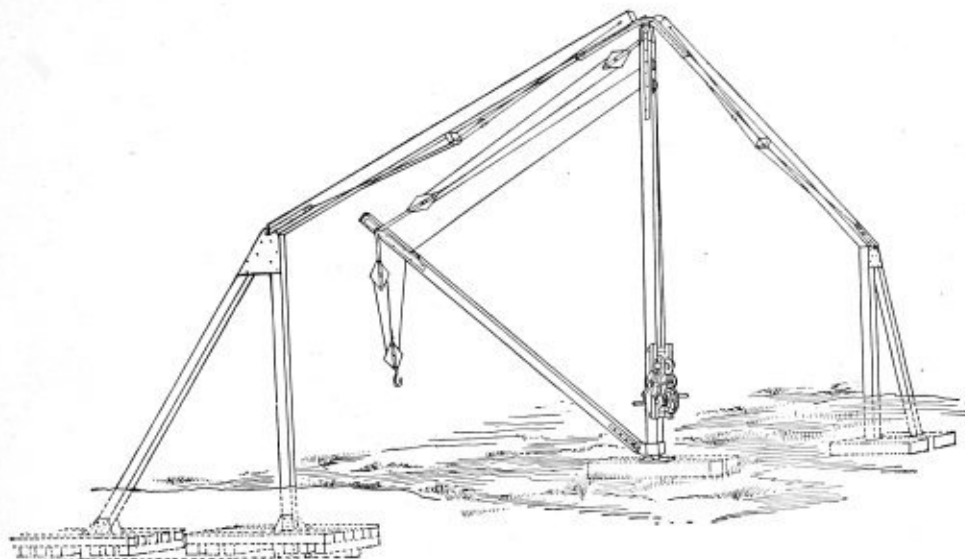
The above illustration shows our No. 1 derrick in operation with a double drum, hand-power wire rope winch; one drum is used for raising and lowering the boom, the other drum for hoisting the load.

A single drum winch is sometimes used where the boom is only lowered or raised occasionally; in this case manila rope and blocks are used for the boom line, which is then hitched to a cleat fastened to the back of the mast.

PRICE LIST—Without Timber, Winch or Wire Rope

Size of Mast. Timbers of Boom, Stiff-legs and Sills. Capacity as usually rated.	Size, Inches Tons	8x8 6x6 1 to 2	10x10 8x8 3 to 5	12x12 10x10 6 to 8	14x14 12x12 10 to 12	16x16 14x14 15
1 FIG. 725, Mast Top Casting, with Straps, 2 Sheaves and Shafts		\$20.00	\$21.50	\$27.00	\$34.00	\$68.00
1 FIG. 745-S, Mast Bottom Cast'g, with Triangular Step and Bolts		13.00	16.00	24.00	34.00	60.00
2 FIG. 805, Top Stiff-leg Irons or Goose-necks, with Bolts		20.00	23.00	28.00	33.00	48.00
2 FIG. 810, Lower Stiff-leg Irons, with Bolts		13.00	14.00	16.00	20.00	30.00
1 FIG. 790, Boom Band, with two Oval Links		3.60	4.40	6.00	7.00	9.00
1 Boom Point Sheave and Shaft		1.75	2.00	2.75	4.00	5.50
1 Single Block, with 4 Links of Chain for Mast Head		6.65	8.00	12.00	20.65	23.00
2 Single Blocks, without hooks, for point of Boom		10.65	12.80	19.20	33.07	36.80
1 Single Fall Block, with Swivel Hook		6.65	8.00	12.00	20.65	23.00
5 Union W. R. Clips		.80	.95	.95	1.05	1.05
2 Galv. W. R. Thimbles		.12	.15	.15	.16	.16
Total, With Plain Sheaves		\$96.22	\$110.80	\$148.05	\$207.58	\$304.51
Add for Self-Lubricating Sheaves		10.50	11.00	12.50	17.50	21.00
		\$106.72	\$121.80	\$160.55	\$225.08	\$325.51

No. 9 FULL CIRCLE STIFF-LEG DERRICK



The above illustration shows a 5-ton derrick furnished the City of Chicago for handling large pipe in the city storage yards. Mast 12x12, 50 feet high; boom 10x10, 50 feet. Fitted with our No. 27 double drum wire rope winch.

Can also be furnished with bull-wheel for operation with our special swinging engine.

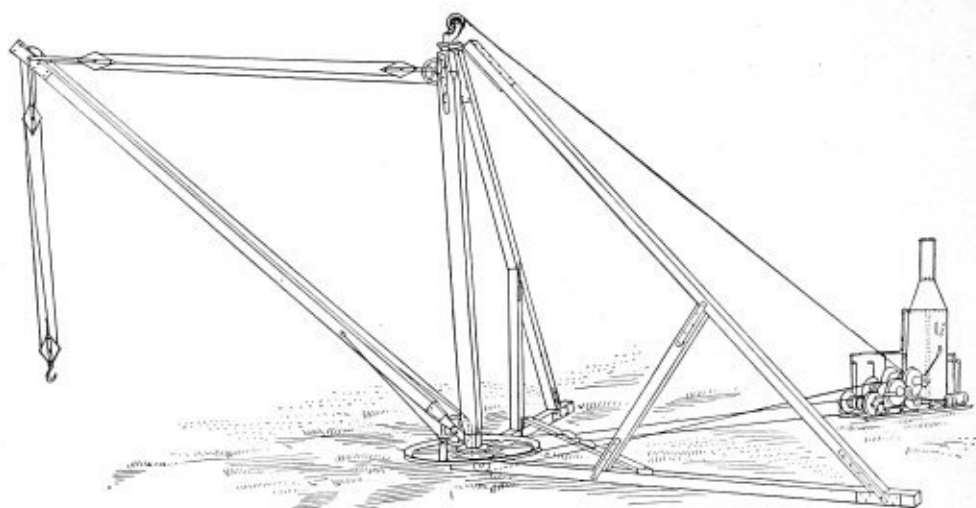
These derricks are used where room is limited, and it is found impossible to use wire rope guys on account of buildings, tracks, etc. When used on a dock, a combination of one stiff-leg and two guys is often desirable. Where the location will permit, the sills of the stiff-legs are sunk about six feet below the surface of the ground. When the sills are used on the surface, they must be loaded down or bolted to the foundation. This style of derrick requires a mast about 10 feet longer than the boom. Capacity from 3 to 10 tons, depending on the size of timbers.

In writing for estimates be sure to state maximum capacity, height of mast and length of boom, size of timbers to be used, also specify whether steam, hand, horse or electric power to be used and unusual conditions, if any.

	STANDARD SIZES			
	10-in. Mast	12-in. Mast	14-in. Mast	16-in. Mast
Derrick irons for 50 ft. Mast and 40 ft. Boom.....
" " " 55 " " " 45 " "
" " " 60 " " " 50 " "
" " " 65 " " " 55 " "
4-Wire Rope Blocks.....
Wire Rope Crab.....
" " Boom and Hoist Lines.....
Boom Truss Rods, Extra.....

No. 13 SPECIAL POWER STIFF-LEG DERRICK

With "Rooster" and "Bull-Wheel"



This derrick can be used with a long boom, swinging to about three-quarters of the circle.

The boom point concentrates all strains in the shaft, avoiding the usual strains which tend to buckle the boom. The sheaves being at the extreme ends of the boom, practically makes the boom between three and four feet longer than the actual length of the boom timber.

Much care has been taken to make the woodwork as simple as possible, so that men of ordinary skill can fit the irons to the timbers. The irons for the end of the boom and for bottom of mast, are shown elsewhere. The stiff-leg irons and timbers are of the simplest construction.

In fitting up these derricks we do not recommend having the boom over once and a half the length of the mast. They are, however, often fitted up with boom twice as long as the mast.

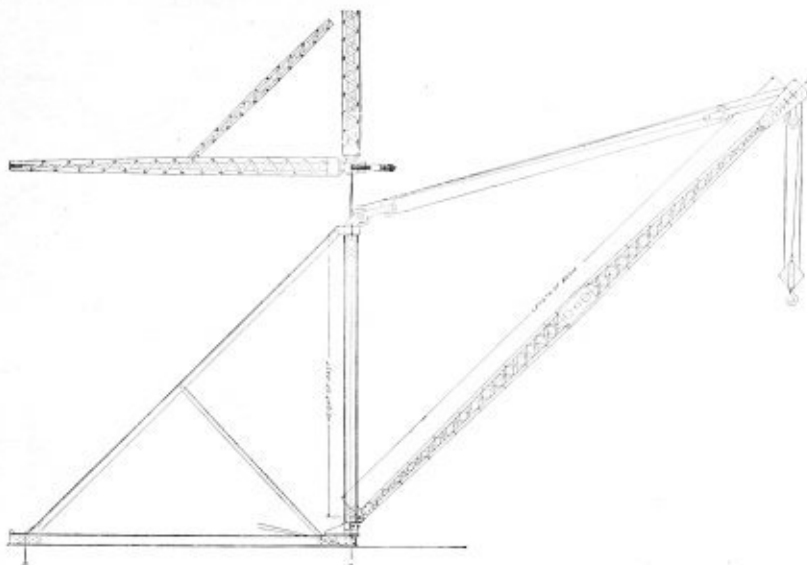
The sills are usually loaded with stone, etc., to give stability.

Our special derrick engine, in combination with the bull-wheel, makes an economical and rapid outfit, capable of doing the greatest amount of work in the shortest time with the fewest men.

Size	} Mast.....Inches	10x10	12x12	14x14	16x16	18x18
of		8x8	10x10	12x12	14x14	16x16
Timber		8x8	10x10	12x12	14x14	16x16
Capacity in tons as usually rated.....	Tons	3 to 5	6 to 8	10 to 12	15	20 to 25
Derrick Irons and Blocks .....		.....	.....	.....	.....	.....
Bull-Wheel and Guide Sheaves.....		.....	.....	.....	.....	.....
Wire Rope and Clips .....		.....	.....	.....	.....	.....
Special Swinging Engine.....		.....	.....	.....	.....	.....
Timber, Extra .....		.....	.....	.....	.....	.....
Truss Rods, Extra .....		.....	.....	.....	.....	.....

Prices Quoted on Application

ALL STEEL STIFF-LEG DERRICK



The derrick shown is fitted with double sheave step for power, but can furnish also with plain step for hand power. If desired derricks can be furnished for wooden stiff legs and sills.

All castings (except sheaves, which are of cast iron and bronze bushed) are made of best O. H. Cast Steel. In order to facilitate shipments, booms are made in one or two pieces, depending on the length. Splice holes are reamed so as to insure an even distribution of the load on the liberal number of bolts in the joint.

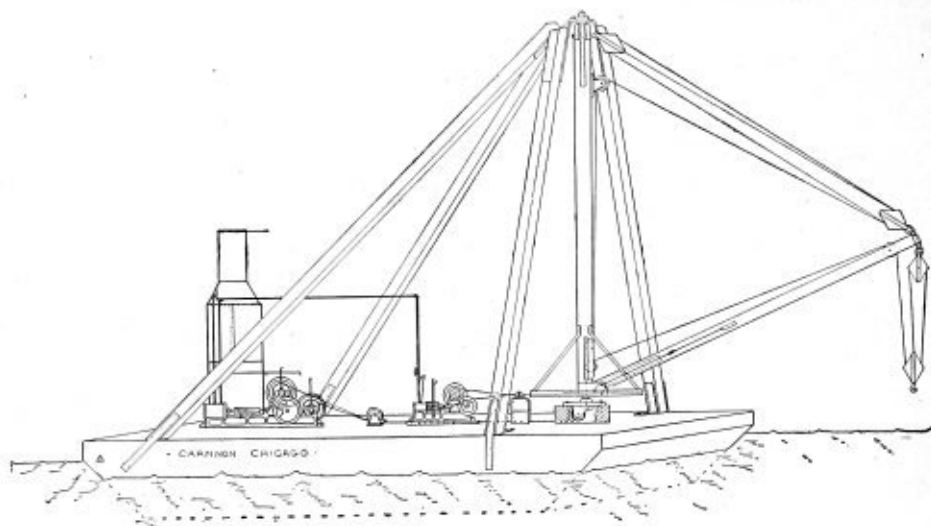
Legs of boom angles and lacing are turned inward, which adds to general appearance of boom and allows it to be handled without danger of bending the angles and reducing the strength of the boom.

Safety Factor of 5 and 6 Employed Throughout

Derrick Number.....M-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Capacity in tons.....	4	4	4	4	5	5	5	5	6½	6½	6½	6½	8	8	8
Max. Strain on Cable in tons.....	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	2.17	2.17	2.17	2.17	3.33	3.33	3.33
Height of Mast in feet.....	15	20	25	30	15	20	25	30	15	20	25	30	15	20	25
Length of Boom in feet.....	38	50	63	75	30	40	50	60	23	30	38	45	38	50	63
Max. Uplift at "B" in tons.....	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	21½	21½	21½
Max. Down Pressure at "B" in tons.....	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	21½	21½	21½
Max. Uplift at "A" in tons.....	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	11	11	11
Max. Down Pressure at "A" in tons.....	21	21	21	21	21	21	21	21	21	21	21	21	40	40	40
Derrick Number.....M-	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Capacity in tons.....	8	10	10	10	10	12	12	13	13	13	13	15	15	20	20
Max. Strain on Cable in tons.....	3.33	3.33	3.33	3.33	3.33	3.00	3.00	3.33	3.33	3.33	3.33	3.00	3.00	3.37	3.37
Height of Mast in feet.....	30	15	20	25	30	20	25	15	20	25	30	20	25	20	25
Length of Boom in feet.....	75	30	40	50	60	50	63	23	30	38	45	40	50	30	38
Max. Uplift at "B" in tons.....	21½	21½	21½	21½	21½	32½	32½	21½	21½	21½	21½	32½	32½	32½	32½
Max. Down Pressure at "B" in tons.....	21½	21½	21½	21½	21½	32½	32½	21½	21½	21½	21½	32½	32½	32½	32½
Max. Uplift at "A" in tons.....	11	11	11	11	11	16½	16½	11	11	11	11	16½	16½	16½	16½
Max. Down Pressure at "A" in tons.....	40	40	40	40	40	60	60	40	40	40	40	60	60	60	60

Prices Quoted Upon Request

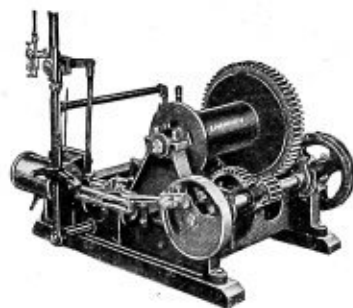
SCOW DERRICKS



The derrick shown above makes a fine outfit for handling stone, concrete, logs, etc., in river and harbor work.

It consists of a set of our regular No. 3 Power Derrick Irons, but with four stiff-legs or braces to mast, which makes a very stiff rig for rough weather and heavy loads—our regular double cylinder, double friction drum hoisting engine, our special 5 x 8 double cylinder, compound geared, link-reversing swinging engine, and our steel bull-wheel for swinging the boom.

While our regular derrick swinging engines, with double drums and a reversing friction swinging gear, have been used on barge derricks, *we do not* recommend them owing to the "listing" of the scow, which throws the mast out of plumb.



Special Swinging Engine

We can furnish special iron work and engines for any size scow derrick.

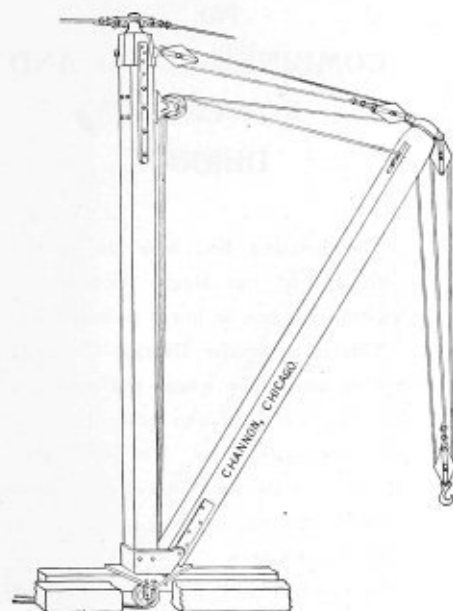
By adding a special boom point with double sheaves this outfit will handle an orange peel or clam shell bucket. The mast on these derricks is usually 40 feet high or less, with booms 60 feet or less.

Mast and boom truss rods can be furnished when desired.

Size of Mast	12 Inches	14 Inches	16 Inches	18 Inches
Iron Work.....
Bull-wheel with Guide Sheaves
Blocks for Wire Rope
Wire Rope for Boom, Hoist and Swinging Lines.....
Double Friction Drum Engine and Boiler.....
Special Independent Swinging Engine.....

Truss Rods and Struts extra. Special Double Sheave Boom Point extra.

No. 1 POWER GUY DERRICK



Bull-Wheel for Swinging by Power May Be Attached

This is the favorite style of power derrick for frequent moving from place to place.

The irons are simple and quickly and easily fitted to timbers. We have avoided irons cutting into the timber as much as possible, which saves time in fitting, also making a stronger outfit throughout.

The lines lead through the sheaves in double mast bracket and pass downward through double sheaves in step to engine drums.

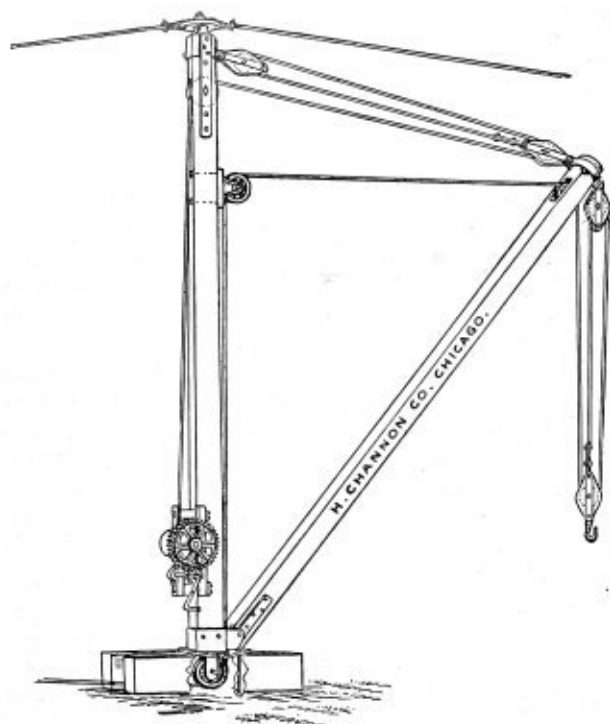
A double friction drum hoisting engine is used and for quick work our steel bull-wheel is attached to mast bottom, operated by our reversing friction swinging drum which may be attached in front of any double drum engine.

When arranged with power swinging attachment, one man can hoist and swing the load into place in the same time that it would take to lift the load only, as the swing commences as soon as the load is started. Plumb the mast sideways but let the top of the mast lean forward toward the boom about six inches.

On level ground the guys are usually furnished three times the height of mast.

PRICE LIST—Without Timber, Wire Rope or Clips

Size of Mast..... Timbers } Boom..... Capacity (as usually rated).....	Size, Inches Tons	8x8 6x6 1 to 2	10x10 8x8 3 to 5	12x12 10x10 6 to 8	14x14 12x12 10 to 12	16x16 14x14 15
1 Fig. 720, Mast Top Casting, with Gudgeon Pin, Straps to Mast and necessary Bolts.....		\$14.00	\$15.00	\$19.00	\$25.00	\$51.00
1 No. 1 Guy Cap.....		4.25	7.00	8.00	9.25	12.50
1 Fig. 750, Mast Bottom Casting, with Double Sheave Step, Straps to Boom and Bolts.....		18.00	22.00	34.00	46.00	73.00
1 Fig. 855, Double Sheave Mast Bracket, with Bolts.....		6.60	6.60	7.60	8.60	10.00
1 Fig. 790, Boom Band, with two Oval Links.....		3.60	4.40	6.00	7.00	9.00
1 Boom Point Sheave and Shaft.....		1.75	2.00	2.75	4.00	5.50
3 Single Wire Rope Blocks, without Hooks, as shown.....		16.00	19.20	28.80	49.62	55.20
1 Single Wire Rope Block, with Swivel Hook for Fall Line....		6.65	8.00	12.00	20.65	23.00
Total, with Plain Sheaves.....		\$70.85	\$84.20	\$118.15	\$170.12	\$239.20
Add for Self-Lubricating Sheaves.....		16.75	17.00	18.00	22.75	26.50
Total with Self-Lubricating Sheaves.....		\$87.60	\$101.20	\$136.15	\$192.87	\$265.70



No. 2 COMBINED HAND AND POWER GUY DERRICK

The hoisting line may be operated with one of our single friction drum hoisting engines or horse power hoister.

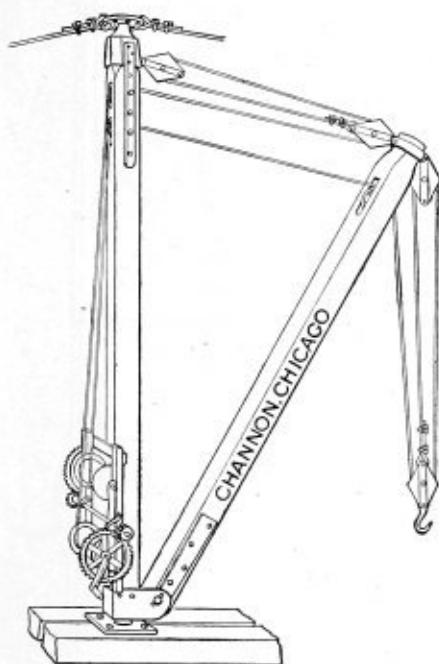
This is a popular Derrick for quarry use or any place where the raising or lowering of the boom takes place but very few times a day. The boom line is operated by the hand power crab shown.

Our irons are quickly and easily attached to timbers.

On level ground, the guys are usually furnished three times the height of mast.

PRICE LIST—Without Timber, Wire Rope or Clips

Size of Mast Timbers } Boom Capacity as usually rated.....	Size, Inches 12 14 16 Tons	8x8 6x6 1 to 2	10x10 8x8 2 to 5	12x12 10x10 6 to 8	14x14 12x12 10 to 12	16x16 14x14 15
1 Fig. 725, Mast Top Casting, with Gudgeon Pin, Straps to Mast and Bolts, but with only one Sheave.....		\$18.25	\$19.50	\$24.25	\$30.00	\$62.50
1 No. 1 Guy Cap.....		4.25	7.00	8.00	9.25	12.50
1 Fig. 750, Mast Bottom Casting, with Straps to Boom and Bolts, but only one Sheave.....		16.25	20.00	31.25	42.00	67.50
1 Fig. 855, Single Mast Bracket.....		4.50	5.00	6.00	7.00	8.75
1 Fig. 790, Boom Band with two Oval Links.....		3.60	4.40	6.00	7.00	9.00
1 Boom Point Sheave, with Shaft.....		1.75	2.00	2.75	4.00	5.50
3 Single Wire Rope Blocks, without Hooks, as shown.....		16.00	19.20	28.80	49.62	55.20
1 Single Wire Rope Block, with Swivel Hook for Fall Line....		6.65	8.00	12.00	20.65	23.00
Total, with Plain Sheaves.....		\$71.25	\$85.10	\$119.05	\$169.52	\$243.95
Add for Self-Lubricating Sheaves.....		15.00	15.50	16.00	21.75	24.75
		\$86.25	\$100.60	\$135.05	\$191.27	\$268.70



No. 3

HAND POWER GUY DERRICK

This is the most popular style of hand power guy derrick. It can be easily set up and quickly moved from place to place.

Our irons require but little work to attach to timber. The outfit shown has a double drum wire rope crab or winch which may be either single or double purchase.

A double drum manila rope winch can be furnished, but we recommend wire as being more satisfactory in the long run.

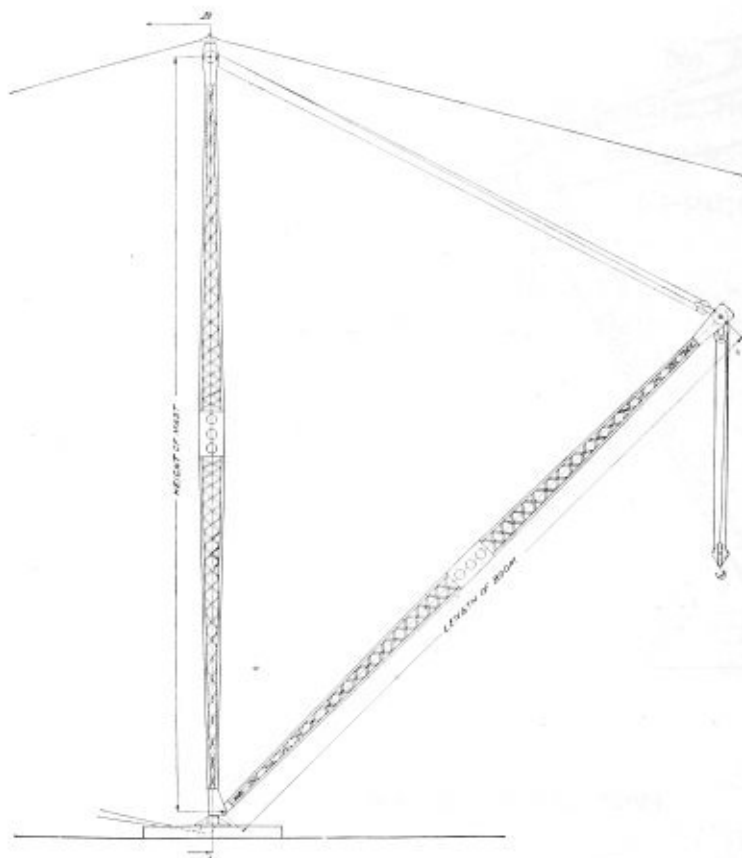
If the boom is to be raised or lowered only occasionally a single drum wire rope crab can be used for wire hoist line, the manila boom line being fastened to a cleat bolted to the back of the mast.

Be sure to state whether the sheaves are to be for wire or manila rope.

PRICE LIST—Without Timber, Wire Rope or Clips

Size of Mast. Timbers / Boom. Capacity (as usually rated).....	Size, Inches Tons	8x8 6x6 1 to 2	10x10 8x8 3 to 5	12x12 10x10 6 to 8	14x14 12x12 10 to 12	16x16 14x14 15
1 FIG. 725, Mast Top Casting, with Gudgeon Pin, Straps to Boom, two Sheaves and necessary Bolts.....		\$20.00	\$21.50	\$27.00	\$34.00	\$68.00
1 No. 1 Guy Cap		4.25	7.00	8.00	9.25	12.50
1 FIG. 745, Mast Bottom Casting, with Step, Straps to Boom and Bolts.....		13.00	16.00	24.00	34.00	60.00
1 FIG. 790, Boom Band, with two Oval Links.....		3.60	4.40	6.00	7.00	9.00
1 Boom Point Sheave and Shaft		1.75	2.00	2.75	4.00	5.50
3 Single Wire Rope Blocks, without Hooks, as shown.....		16.00	19.20	28.80	49.62	55.20
1 Single Wire Rope Block, with Swivel Hook for Fall Line....		6.65	8.00	12.00	20.65	23.00
Total, with Plain Sheaves.....		\$65.25	\$78.10	\$108.55	\$158.52	\$233.20
Add for Self-Lubricating Sheaves.....		10.00	10.50	12.00	16.75	20.50
		\$75.25	\$88.60	\$120.55	\$175.27	\$253.70

ALL STEEL GUY DERRICKS



The derrick shown is fitted with double sheave step for power, but can furnish also with plain step for hand power use.

The mast and boom are constructed of angles and plates thoroughly laced. Legs of angles are turned inward, which not only adds to the general appearance but also allows parts to be handled without danger of bending the angles and thereby reducing the strength.

All castings (excepting sheaves, which are of cast iron and bronze bushed) for these derricks are of the best open hearth cast steel, thus insuring ample strength and at the same time furnishing parts that can be carefully handled.

In order to facilitate shipment, mast and boom are made in one or two pieces, depending on the length. Splice holes are reamed so as to insure an even distribution of load on a liberal quantity of bolts in joint.

Safety Factor of 5 and 6 Used Throughout

Derrick Number.....	100	101	102	103	104	105	106	107	108	109	110	111
Capacity in tons.....	5	5	5	5	5	10	10	10	10	15	15	15
Size of Cable in inches.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Max. Strain on Cable in tons...	1.66	1.66	1.66	1.66	1.66	3.33	3.33	3.33	3.33	3.00	3.00	3.00
Height of Mast in feet.....	45	55	65	75	85	45	55	65	75	45	55	65
Length of Boom in feet.....	40	50	60	70	80	40	50	60	70	40	50	60
Max. Down Pressure at "A" tons	8	8	8	8	8	16	16	16	16	24	24	24
Max. Side Strain at "A" in tons	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	16	16	16
Max. Side Strain at "B" in tons	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	16	16	16

Prices Quoted Upon Request



No. 25 HAND POWER, "BREAST," OR BUILDER'S DERRICK

These derricks are exceptionally well made and well proportioned throughout.

The drums are cast iron with strong flanges, gearing is heavy and strong.

The size mostly used is 30 ft., which is sufficient for raising material for the first two stories of ordinary buildings; the derrick is raised from floor to floor as work progresses.

Rope and blocks are extra.

Dimensions and Price List

	16 Feet	20 Feet	24 Feet	30 Feet	40 Feet
Height of Timbers.....	4 x 6	6 x 6	6 x 8	8 x 8	8 x 8
Size of Timbers, Inches.....	6	6	6	9	9
Diameter of Drum, Inches.....					
Length of Drum, between flanges, Inches.....	42	48	60	66	72

Parts Furnished

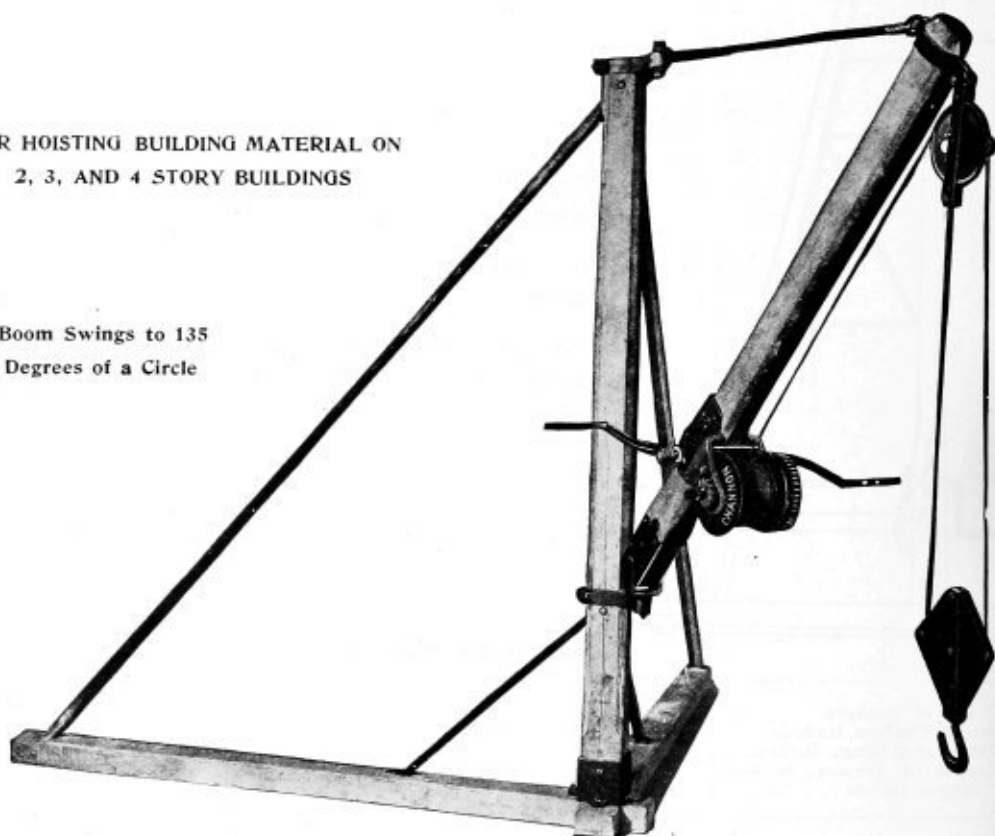
2 Square Bands with Rings...	\$2.00	\$2.50	\$ 2.50	\$ 3.00	\$ 3.00
4 Plain "U" Straps	3.00	3.50	3.50	4.00	4.00
1 Ring Eyebolt.....	1.00	1.00	1.00	1.00	1.00
2 Bearings for Pinion Shaft...	1.50	1.50	1.50	2.50	2.50
2 Bearings for Drum Shaft...	1.50	1.50	1.50	2.50	2.50
1 Pinion Shaft.....	3.00	3.50	4.50	6.00	7.00
1 Drum Shaft	4.00	4.50	5.50	7.50	8.50
1 Pinion	1.00	1.00	1.00	1.00	1.00
1 Gear	6.50	7.50	7.50	7.50	7.50
1 Drum	6.50	7.50	10.00	12.50	14.50
2 Cranks.....	2.00	2.00	2.00	2.00	2.00
2 Plain Square Bands	1.00	1.50	1.50	1.50	2.00
2 Rollers with Frame	4.00	4.00	4.00	4.00	4.00
3 Brace Irons	2.00	2.50	3.00	4.00	4.50
1 Shifting Pawl .....	.50	.50	.50	.50	.50
1 Collar.....	.50	.50	.50	.50	.50
Price complete without Timbers	\$40.00	\$45.00	\$50.00	\$60.00	\$ 65.00
Price complete with Timbers	63.00	65.00	75.00	87.00	112.00

All prices are for parts with bolts included

"UNION" STIFF-LEG BUILDERS' DERRICK

FOR HOISTING BUILDING MATERIAL ON
2, 3, AND 4 STORY BUILDINGS

Boom Swings to 135
Degrees of a Circle



The geared winch furnished has two speeds, ratchets and pawl and two cranks for operation by one or two men.

These derricks are light but strong and can be quickly and easily set up and taken down.

No. 1—CAPACITY 1,000 POUNDS

Boom, 4x5 inches; length 7 feet, 6 inches.
Sills, 3x6 inches; length, 9 feet.

Mast, 6x6 inches; height, 8 feet.
Angle Iron Back Legs.

Complete as shown, including 100 feet $\frac{1}{4}$ -inch steel cable, timbers, iron work, winch and blocks. Price...**\$50.00**

No. 2—CAPACITY 2,000 POUNDS

Boom, 5x6 inches; length, 8 feet, 9 inches.
Sills, 4x6 inches; length, 10 feet.

Mast, 6x6 inches; height, 9 feet.
Angle Iron Back Legs.

Complete as shown, including 150 feet $\frac{3}{8}$ -inch steel cable, timbers, iron work, winch and blocks. Price...**\$75.00**

No. 17 CONTRACTORS' "SULKY" TRENCH DERRICK

For Laying Water Mains, Etc.

For one ton capacity we furnish an 18-foot derrick as shown, with two large wooden wheels, timber and iron work, using single purchase winch, with a 5x20-inch drum. Capacity 2000 pounds on a single line, which has lever brake.

Price, as shown, but without chain or block..... \$95.00

Extra, for two small wheels for moving along trench..... 10.00



No. 27. TRIPOD DERRICK

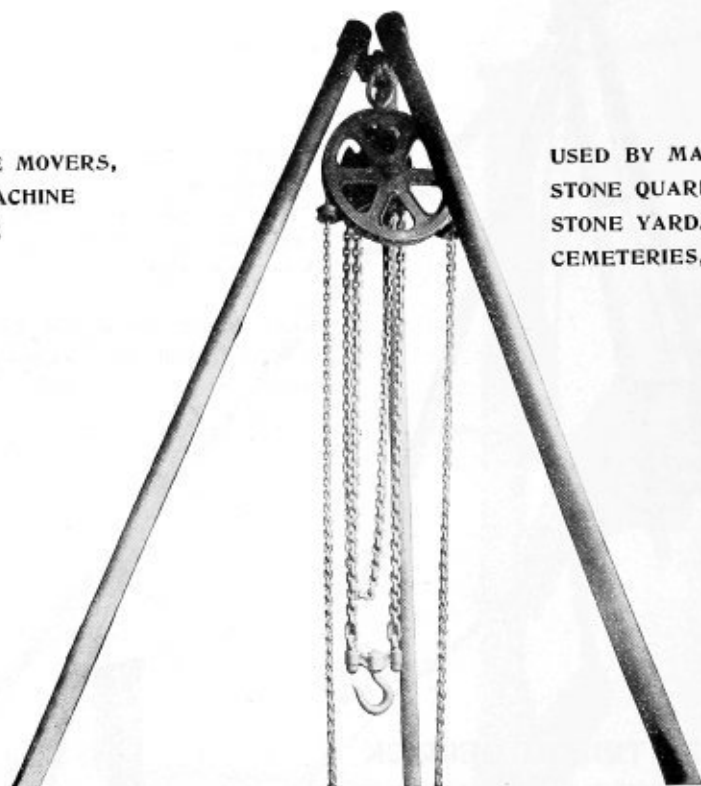
Size Number	Height of Timbers, in Feet	Size of Timber, Inches	Diameter of Drum, Inches	Length of Drum between Flanges, Inches	Price with Timber Complete, but without Rope or Blocks	Price, Iron-work only
A	16	6x8	4	21	\$65.00	\$44.00
B	20	8x8	6	21	70.00	50.00
C	24	8x8	6	26	80.00	60.00
D	28	8x8	6	30	95.00	75.00

Blocks and rope, either wire or manila.
Can also be furnished with four legs if desired.



CHANNON PORTABLE FOLDING TRIPOD DERRICK

USED BY SAFE MOVERS,
FOUNDRIES, MACHINE
SHOPS, BRIDGE
SHOPS, ETC.



USED BY MARBLE WORKS
STONE QUARRIES,
STONE YARDS,
CEMETERIES, ETC.

TRIPOD SHOWING CHAIN HOIST ATTACHED

The above cut does not show spikes on bottom of legs, which give a firm grip on floor.

Prices below do not include chain hoist

No.	Capacity	Length, Folded	Weight of Derrick	Price Each
1	1,000 lbs.	12 ft.	68 lbs.	\$12.50
2	2,000 "	12 "	90 "	15.00
3	4,000 "	12 "	120 "	18.75
4	6,000 "	14 "	165 "	25.00
5	12,000 "	14 "	285 "	37.50
6	16,000 "	16 "	375 "	53.50
7	20,000 "	16 "	425 "	60.00
8	30,000 "	16 "	450 "	65.00

These derricks are made of wrought iron pipe, and can be folded together. They are light, cheap, convenient to handle, and take up little room when not in use. They are always ready, as nothing has to be taken apart which might get lost.

CHICAGO FOUNDATION POWER WINCH HEADS**With Sheaves and Shafts**

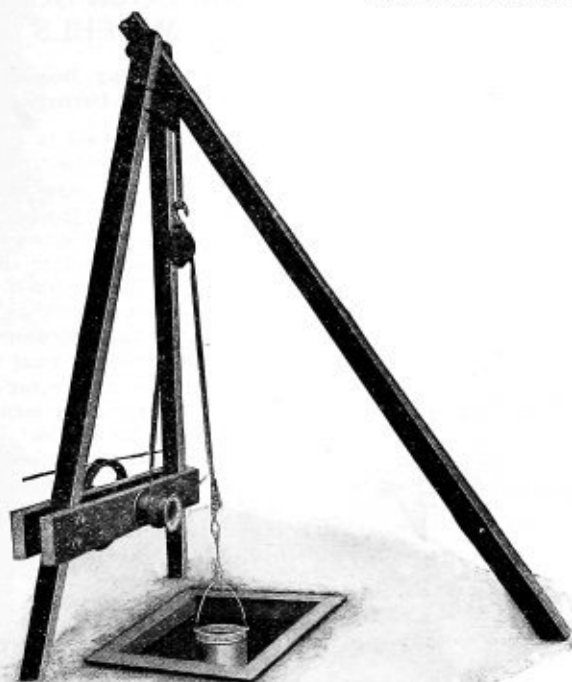
Used in sinking deep foundation holes or shafts for large buildings.

The materials and men are hoisted up and let down by means of bucket attached to a manila rope which is wrapped around the winch head shown in cut.

The power is supplied through an endless wire rope which passes around sheave which revolves constantly. A number of these outfits are operated at one time over a line of holes, from power furnished by a Standard Hoisting Engine, to which is attached a sheave, also a governor to give uniform speed.

The outfit consists of a Turned Winch Head, diameter of flanges 11 inches, diameter in center 7 inches, length between flanges 9 inches, shaft $1\frac{1}{2}$ by 24 inches, wire rope sheave $27\frac{1}{2}$ inches diameter by $3\frac{1}{2}$ inches wide.

Price. \$25.00

**HAND POWER OUTFIT**

Consists of a wooden tripod, to two legs of which are attached a drum with shaft and boxes similar to that shown on our No. 25 builders derrick, but smaller. Our special cargo blocks are used with manila rope. See index.

Price of iron work for winch..... Application

Price of new style block, shown above..... Application

Price of Champion Howser-Laid Manila Rope, per pound..... Application

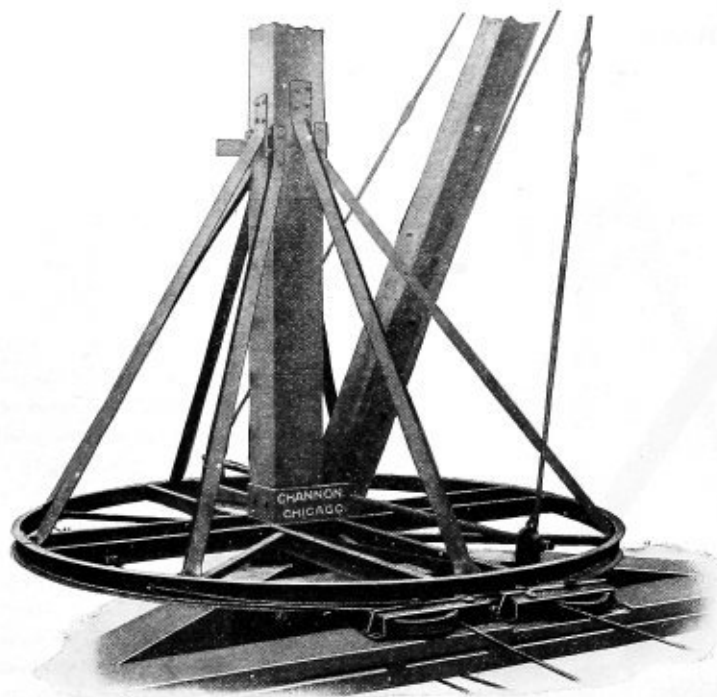
BUCKETS

These vary in size and capacity. We can furnish promptly any style wanted. See index.

BRACE IRONS AND BOLTS

Our shop is prepared to turn out promptly the irons used to brace the planking for inside foundation shafts.

As our catalogue indicates, we carry everything that is required in this class of work.



Reproduction of Photograph of 12 foot Diameter Bull-wheel, Showing Braces to Mast and Turnbuckle Rods to Boom.

CHANNON STEEL DERRICK BULL- WHEELS

For Swinging Booms on Power Derricks

This Bull-wheel is a most valuable feature in any derrick, and will save enough time and labor to pay for itself several times in a season.

May be attached to any of our power derrick mast bottoms without any changes.

It takes time and money to swing a derrick by hand with men pulling on the tag line when teams, cars or men are waiting for the derrick.

With our Bull-wheel and special derrick swinging engine the engineer can lift the load and swing it into place in the same time it takes to do the lifting only.

Our wheel is exceptionally strong and well braced.

Sizes and Prices Complete with Braces to Mast and Turnbuckle Rods to Boom but Without Guide-Sheaves.

No.	Diameter in Feet	For Derrick Booms, Length	Size of Channel Iron Used	Weight Complete, Pounds	Price Complete
1	8	40 ft. or less	5 inch	1,600	\$100.00
2	10	50 "	5 "	1,700	110.00
3	12	60 "	6 "	2,000	130.00
4	14	70 "	7 "	3,000	265.00
5	16	80 "	8 "	3,700	335.00
6	16 Ex. Hvy.	80 "	10 "	4,500	500.00

GUIDE-SHEAVES AND ROLLERS IN FRAME

For Leading Rope from Bull-wheel to Swinging Drum of Engine



No. 840

Diameter of Large Sheave, Inches	Diameter of Small Wheels, Inches	DIAMETER OF PINS, INCHES		PRICE EACH	
		Large	Small	Common Sheave	Self-Lubricating Sheave
10	2½	1	¾	\$ 6.50	\$ 8.00
12	3	1½	1	8.00	10.00
14	4	1½	1½	10.00	14.00
16	5	1½	2	13.00	17.00
18	6	1½	2½	16.50	22.00

The small rollers, or sheaves, prevent the rope from getting out of groove of larger sheave, also of several positions for different leading angles.

DERRICK IRONS

MAST TOP CASTINGS

For Guy Derricks Guy Cap is Used. For Stiff-Leg Derricks Top Stiff-Leg Irons



No. 725
With Two
Sheaves
and Shafts

Size of Mast Timber, Inches	Diameter of Gudgeon Pin, Inches	No. 720 Without Sheaves, Each	No. 725		No. 725	
			WITH ONE SHEAVE		WITH TWO SHEAVES	
			Plain	Self-Lubricating	Plain	Self-Lubricating
8 x 8	2	\$14.00	\$18.25	\$19.50	\$20.00	\$22.25
10 x 10	2 1/4	15.00	19.50	20.50	21.50	23.75
12 x 12	2 3/4	19.00	24.25	26.00	27.00	30.50
14 x 14	3	25.00	30.00	32.25	34.00	37.75
16 x 16	3 1/2	31.00	32.50	35.00	38.00	41.00
18 x 18	4 1/2	41.00	43.50	46.00	48.00	51.00

NOTE.—We furnish a heavy wrought iron nut eyebolt for block for boom line, which extends clear through top casting.



No. 720
With
Straps but
No Sheaves

No. 718 MAST TOP

With Off-Set Gudgeon and Side Straps

Inside Measure	Price
8 Inches	\$16.50
10 Inches	20.50
12 Inches	27.50
14 Inches	35.00
16 Inches	46.00



GUY CAP, No. 1

Size	Number of Links for Guys	Diameter of Cap, Inches	Price with Ring and Links
A	4	8	\$ 4.25
B	4	10 and 12	6.20
C	5	8	5.80
D	5	10	7.00
E	5	12	8.00
F	6	14	9.25
G	8	10	10.00
H	8	16	12.50



GUY CAP, No. 2

Size	Number of Guys	Diameter of Mast, Inches	Price
A	4	8	\$4.25
B	4	10	6.00
C	5	8	4.50
D	5	10	6.25
E	5	12	7.00
F	6	14	8.00
G	6	16	11.00
H	8	16	13.00

SINGLE MAST SHEAVE WITH BRACKET

For Center of Mast

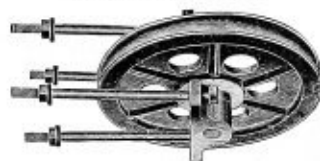


Fig. 845

Diameter of Sheaves, Inches	Bolt for	Common Sheaves	Self-Lubricating Sheaves
10	10 in. Mast	\$4.20	\$ 6.75
12	12 "	4.75	7.25
14	12 "	5.50	8.00
16	14 "	6.50	9.25
18	16 "	8.00	11.00

MAST SHEAVES WITH BRACKET

For Face of Mast



Fig. 855. Double

Diameter Sheaves, Inches	Bolts for	COMMON SHEAVES		SELF-LUBRICATING SHEAVES	
		Single	Double	Single	Double
10	10 in. Mast	\$4.50	\$6.60	\$7.00	\$10.50
12	12 "	5.00	7.00	7.50	12.00
14	12 "	6.00	8.60	8.50	13.50
16	14 "	7.00	10.00	10.00	15.00
18	16 "	8.75	14.00	12.00	19.50

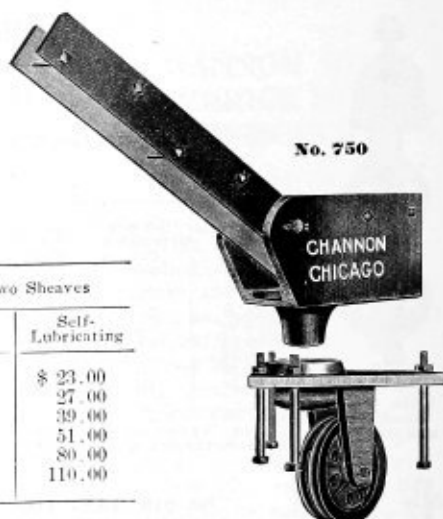
DERRICK IRONS

Mast Bottom with Step and Double Sheaves, Boom Plates and Bolts

Furnished with square step for Guy Derricks and triangular step for Stiff-Leg Derricks.

No. 750

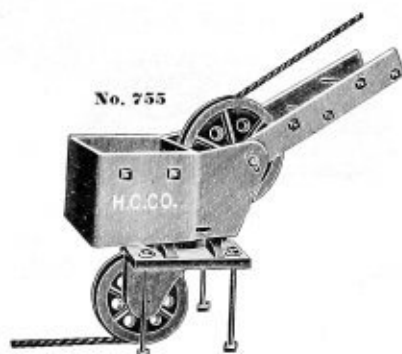
For Mast Size, Inches	For Boom Size, Inches	With One Sheave		With Two Sheaves	
		Plain	Self-Lubricating	Plain	Self-Lubricating
8x 8	6x 6	\$16.25	\$20.25	\$18.00	\$ 23.00
10x10	8x 8	20.00	23.75	22.00	27.00
12x12	10x10	31.25	34.50	34.00	39.00
14x14	12x12	42.00	45.50	46.00	51.00
16x16	14x14	67.50	71.50	73.00	80.00
18x18	16x16	86.50	98.50	95.00	110.00



Mast Bottom with Step and Single Sheave, Boom Plates, Sheave in Boom and Bolts

No. 755

For Mast Size, Inches	For Boom Size, Inches	PRICE COMPLETE	
		Common Sheaves	Self-Lubr. Sheaves
8x 8	6x 6	\$ 22.00	\$ 27.00
10x10	8x 8	26.00	31.00
12x12	10x10	38.00	44.00
14x14	12x12	52.00	58.00
16x16	14x14	80.00	88.00
18x18	16x16	105.00	120.00



No. 745

Mast Bottom with Square Step, Boom Plates and Bolts

For hand power Guy Derricks.

No. 745



No. 745 S.

Mast Bottom with Triangular Step, Boom Plates and Bolts

For hand power Stiff-Leg Derricks.

No. 745 S.

For Mast Size, Inches	For Boom Size, Inches	Price, Each	For Mast Size, Inches	For Boom Size, Inches	Price, Each
8x 8	6x 6	\$13.00	8x 8	6x 6	\$13.00
10x10	8x 8	16.00	10x10	8x 8	16.00
12x12	10x10	24.00	12x12	10x10	24.00
14x14	12x12	34.00	14x14	12x12	34.00
16x16	14x14	60.00	16x16	14x14	60.00

DERRICK IRONS

TOP STIFF-LEG IRONS

Size of Timber, Inches	Size of Main Iron, Inches	Size of Washer Iron, Inches	Diameter of Hole for Gudgeon Pin, Inches	Diameter of Bolts, Inches	Length of Washer Iron, Inches	Price Complete with Bolts
6x6	5x	5x $\frac{3}{4}$	2	$\frac{3}{8}$	30	\$10.00
8x8	6x	6x $\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{3}{8}$	30	11.50
8x8	6x	6x $\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{3}{8}$	30	11.50
10x10	6x	6x $\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{3}{8}$	36	12.50
10x10	6x	6x $\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{3}{8}$	36	12.50
12x12	8x1	8x $\frac{3}{4}$	3	$\frac{3}{8}$	40	15.50
12x12	8x1	8x $\frac{3}{4}$	3 $\frac{1}{2}$	$\frac{3}{8}$	40	16.50
14x14	10x1 $\frac{1}{2}$	10x $\frac{5}{8}$	3 $\frac{1}{2}$	1	42	24.00
14x14	10x1 $\frac{1}{2}$	10x $\frac{5}{8}$	4	1	48	30.00
14x14	12x1 $\frac{1}{2}$	12x $\frac{5}{8}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	48	36.00
16x16	14x1 $\frac{1}{2}$	14x $\frac{5}{8}$	5	1 $\frac{1}{2}$	48	50.00
16x16	14x2	14x $\frac{5}{8}$	5	1 $\frac{1}{2}$	48	70.00



Fig. 805

LOWER STIFF-LEG IRONS



Fig. 810

Size of Timber, Inches	Size of Long Irons, Inches	Length of Long Irons, Inches	Size of Short Irons, Inches	Length of Short Irons, Inches	Diameter of Center Pin, Inches	Diameter of Bolts, Inches	Price Complete with Pin and Bolts
6x6	$\frac{1}{2}$ x4	30	$\frac{1}{2}$ x8	20	1	$\frac{3}{8}$	\$6.50
8x8	$\frac{1}{2}$ x4	30	$\frac{1}{2}$ x8	20	1 $\frac{1}{4}$	$\frac{3}{8}$	7.00
10x10	$\frac{1}{2}$ x4	36	$\frac{1}{2}$ x8	24	1 $\frac{1}{4}$	$\frac{3}{8}$	8.00
12x12	$\frac{3}{4}$ x5	36	4x8	24	1 $\frac{1}{4}$	$\frac{3}{8}$	10.00
14x14	$\frac{3}{4}$ x6	36	1 x10	24	1 $\frac{1}{2}$	$\frac{3}{8}$	15.00
16x16	1 x8	42	1 $\frac{1}{2}$ x12	30	2	1	30.00
16x16	1 $\frac{1}{2}$ x8	42	1 $\frac{1}{2}$ x12	30	2	1	40.00

STIFF LEG BRACE IRONS

BOOM PLATES



Fig. 820



Fig. 815

Timber...inches	6x6	8x8	10x10	12x12	14x14
Size of iron "	$\frac{1}{2}$ x5	$\frac{1}{2}$ x6	$\frac{1}{2}$ x6	$\frac{3}{4}$ x8	1x10
Length of iron "	36	36	36	36	40
With bolts...each	\$3.50	\$4.25	\$4.25	\$7.25	\$12.00

Timber...inches	6x6	8x8	10x10	12x12	14x14
Size of iron "	$\frac{1}{2}$ x5	$\frac{1}{2}$ x6	$\frac{1}{2}$ x8	$\frac{3}{4}$ x8	1x10
Length of iron "	36	36	36	40	40
With bolts...each	\$3.00	\$3.50	\$4.50	\$6.50	\$10.00

DERRICK IRONS



**PLAIN MAST BOTTOM
AND STEP WITH
BOLTS**

For Hand Power Derrick

No. 760

For Mast Inches	Inside Measure of Mast Bottom	Price Complete
8x 8	7x 7 inches	\$ 7.50
10x10	9x 9 inches	9.25
12x12	10x10 inches	12.25
14x14	12x12 inches	15.00



**PLAIN BOOM SEAT
WITH SHAFT BOOM
PLATES AND BOLTS**

For Mast and Boom

No. 770

For Booms Size	Without Boom Plates or Bolts (as shown)	With Boom Plates, Shaft and Bolts
6x 6 inches	\$3.25	\$ 6.75
8x 8 inches	4.00	8.25
10x10 inches	4.75	9.00
12x12 inches	5.50	12.75



**SHEAVE WITH SHAFT
AND BOXES**

No Bolts

Furnished with sheave shrunk on shaft with bab-bit boxes or with bronze bushed self-lubricating sheave loose on shaft.

No. 835

Diameter of Sheave	Diameter of Wire Rope	Diameter of Shaft	Sheave Shrunk on Shaft	Self-Lubricat- ing Sheave
10 in.	$\frac{3}{8}$ - $\frac{1}{2}$ in.	1	\$5.00	\$ 6.00
12 in.	$\frac{1}{2}$ - $\frac{5}{8}$ in.	$1\frac{1}{4}$	5.50	6.75
14 in.	$\frac{5}{8}$ - $\frac{3}{4}$ in.	$1\frac{3}{4}$	6.50	8.25
16 in.	$\frac{3}{4}$ - 1 in.	$1\frac{1}{2}$	7.50	9.00
18 in.	$\frac{3}{4}$ - 1 in.	$1\frac{3}{4}$	8.50	11.50

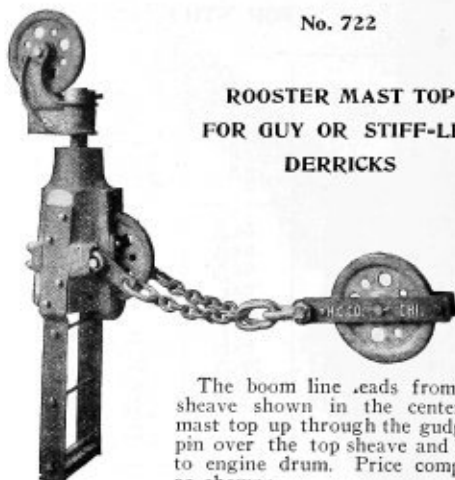


**CLEAT FOR MAST
With Bolts**

10 in., wt. 8 lbs.,	\$1.20
12 in., wt. 9 lbs.,	1.35
14 in., wt. 12 lbs.,	1.80
16 in., wt. 20 lbs.,	3.00
18 in., wt. 30 lbs.,	4.50

No. 865. With Bolts

No. 722



**ROOSTER MAST TOP
FOR GUY OR STIFF-LEG
DERRICKS**

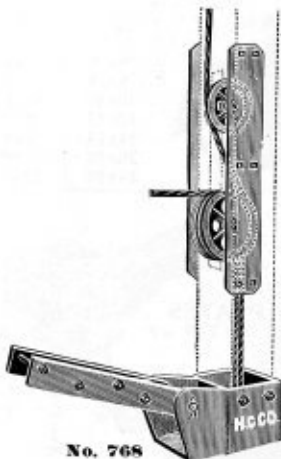
The boom line leads from the sheave shown in the center of mast top up through the gudgeon pin over the top sheave and back to engine drum. Price complete as shown:

Mast Size, Inches	Price Complete with Plain Sheaves	Price Complete with Self-Lubricating Sheaves
10x10	\$ 74.00	\$ 77.00
12x12	80.00	83.00
14x14	107.00	112.00
16x16	152.00	147.00
18x18	185.00	194.00

No. 768

**MAST SHEAVES,
SHAFTS, BOXES,
PLATES AND
BOLTS**

This arrangement may be used with our Fig. 750 mast bottom, instead of mast brackets bolted to face of mast.



No. 768

Price without mast bottom casting:

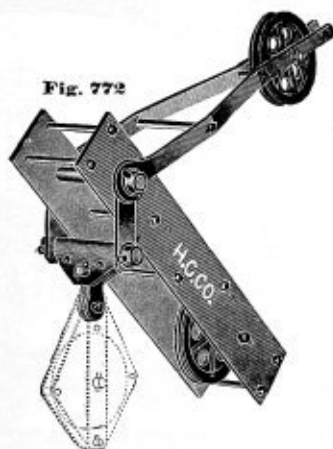
Size of Mast, Inches	Price with Common Sheaves	Price with Self-Lubr. Sheaves
8x 8	\$ 8.00	\$11.00
10x10	10.00	14.25
12x12	17.50	23.00
14x14	23.50	29.00
16x16	30.00	39.00
18x18	40.00	50.00

DERRICK IRONS

STEEL BOOM END

With Plates, Straps, Sheaves, Shafts and Bolts.

Fig. 772



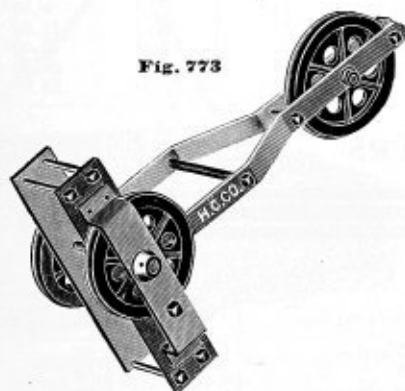
Size of Boom	Size of Sheaves	Price with Plain Sheaves	Price with Self-Lubri. Sheaves
8x8	12	\$28.00	\$30.00
10x10	14	32.00	35.00
12x12	16	36.00	40.00
14x14	18	38.00	44.00
16x16	20	52.00	58.00

Price does not include lower block (dotted).

STEEL BOOM POINT

For Clam-Shell and Orange-Peel Buckets:

Fig. 773



Size of Boom	Outside Diameter of Sheaves	Self-Lubri. Sheaves
10x10	22 inches	\$55.00
12x12	24 "	60.00
14x14	24 "	65.00
16x16	30 "	80.00

FORGED BOOM BANDS OR RINGS



Fig. 790 Standard

FLAT BOLTED BAND WITH TWO LINKS

No.	Inside Diam., Inches	Size of Iron, Inches	Price Each
1	7	$\frac{3}{4}$ x $2\frac{1}{2}$	\$3.60
2	8	$\frac{3}{4}$ x $2\frac{1}{2}$	4.00
3	9	$\frac{3}{4}$ x $2\frac{1}{2}$	4.40
4	10	$\frac{3}{4}$ x 3	5.00
5	11	$\frac{3}{4}$ x 3	6.00
6	13	1 x $3\frac{1}{2}$	7.00
7	15	1 $\frac{1}{4}$ x 4	8.00
8	17	1 $\frac{1}{4}$ x 5	9.00

FLAT EYE BANDS



No. 795. Two Eyes



No. 800. Two Eyes, Two Links

No.	Inside Diameter, Inches	Size of Iron, Inches	Price Each	
			No. 795	No. 800
1	7	$\frac{3}{4}$ x 3	\$5.50	\$7.25
2	8	$\frac{3}{4}$ x 3	5.50	7.25
3	9	$\frac{3}{4}$ x 3	6.50	9.00
4	10	1 x 3	9.50	11.50
5	11	1 x 3	10.00	12.50
6	13	1 x $3\frac{1}{2}$	12.50	15.00

PLAIN FLAT BANDS



No. 775. No Links



No. 780. One D Link



No. 785. Two D Links

No.	Inside Diameter, Inches	Size of Iron, Inches	Price Each		
			No. 775	No. 780	No. 785
1	7	$\frac{3}{4}$ x $2\frac{1}{2}$	\$1.20	\$1.37	\$1.80
2	8	$\frac{3}{4}$ x $2\frac{1}{2}$	1.30	1.70	2.20
3	9	$\frac{3}{4}$ x $2\frac{1}{2}$	1.50	2.20	2.70
4	10	$\frac{3}{4}$ x 3	1.75	2.60	3.20
5	11	$\frac{3}{4}$ x 3	2.00	3.20	4.00
6	13	1 x $3\frac{1}{2}$	2.50	4.00	5.25

FLAT SPLIT BOOM BAND WITH STRAP



Fig. 787

No.	Inside Diameter	Price
1	8 inches	\$13.00
2	9 "	14.50
3	10 "	17.00
4	12 "	20.00
5	14 "	23.25

TRUSS RODS WITH TURNBUCKLE AND STRUT



Diameter of Rod	Length of Rod	Price Each with Strut	Diameter of Rod	Length of Rod	Price Each with Strut
$\frac{3}{4}$ inches	25 feet	\$14.00	$\frac{7}{8}$ inches	55 feet	\$19.50
$\frac{3}{4}$ "	35 "	15.00	$\frac{7}{8}$ "	65 "	21.00
$\frac{3}{4}$ "	45 "	16.00	1 "	35 "	19.00
$\frac{3}{4}$ "	55 "	17.00	1 "	45 "	21.00
$\frac{7}{8}$ "	25 "	15.00	1 "	55 "	23.00
$\frac{7}{8}$ "	35 "	16.50	1 "	65 "	25.00
$\frac{7}{8}$ "	45 "	18.00			

PRESSED WROUGHT IRON OR "BRIDGE" TURNBUCKLES



Standard lengths.

Diameter of Thread, Inches	Opening between Heads, Inches	Total Length, Inches	Price Each	Diameter of Thread, Inches	Opening between Heads, Inches	Total Length, Inches	Price Each
$\frac{1}{8}$	$5\frac{1}{2}$	22	\$0.40	$1\frac{1}{8}$	$5\frac{1}{2}$	28	\$1.75
$\frac{1}{4}$	$5\frac{1}{2}$	22	.42	$1\frac{1}{4}$	$5\frac{1}{2}$	28	2.00
$\frac{3}{8}$	$5\frac{1}{2}$	22	.45	$1\frac{3}{8}$	$5\frac{1}{2}$	29	2.25
$\frac{1}{2}$	$5\frac{1}{2}$	22	.48	$1\frac{1}{2}$	$5\frac{1}{2}$	29	2.65
$\frac{5}{8}$	$5\frac{1}{2}$	22	.50	$1\frac{3}{4}$	$5\frac{1}{2}$	29	3.10
$\frac{3}{4}$	$5\frac{1}{2}$	23	.63	$2\frac{1}{4}$	$5\frac{1}{2}$	30	3.50
$\frac{7}{8}$	$5\frac{1}{2}$	24	.75	$2\frac{3}{8}$	$5\frac{1}{2}$	31	4.00
1	$5\frac{1}{2}$	25	.88	$2\frac{1}{2}$	$5\frac{1}{2}$	32	4.50
$1\frac{1}{8}$	$5\frac{1}{2}$	25	1.00	$2\frac{3}{4}$	$5\frac{1}{2}$	32	5.00
$1\frac{1}{4}$	$5\frac{1}{2}$	26	1.25	$2\frac{7}{8}$	$5\frac{1}{2}$	33	5.50
$1\frac{3}{8}$	$5\frac{1}{2}$	27	1.38	3	$5\frac{1}{2}$	33	6.00
$1\frac{1}{2}$	$5\frac{1}{2}$	27	1.50			34	6.50

WROUGHT IRON TURNBUCKLES



With hook and eye, two eyes, or two hooks.

Outside Diameter Screw, Inches	Length in Clear between Heads, Inches	Price Each	
		Black	Galvanized
$\frac{5}{16}$	$4\frac{1}{4}$	\$.90	\$ 1.10
$\frac{3}{8}$	$4\frac{1}{2}$	1.10	1.30
$\frac{1}{2}$	5	1.25	1.50
$\frac{5}{8}$	6	1.55	1.80
$\frac{3}{4}$	7	1.85	2.10
$\frac{7}{8}$	8	2.00	2.40
1	9	2.75	3.50
$1\frac{1}{8}$	10	3.50	4.25
$1\frac{1}{4}$	11	4.25	5.50
$1\frac{3}{8}$	12	5.25	7.00
$1\frac{1}{2}$	13	6.25	8.25
$1\frac{3}{4}$	14	7.50	9.50
$1\frac{7}{8}$	15	9.00	11.00
2	16	13.00	15.00
$2\frac{1}{4}$	16	17.00	20.00
2	16	25.00	28.00

GUY TIGHTENERS



LONG PATTERN

No.	Diameter of Screw	Length of Take-up	Price Each
10	$\frac{3}{4}$ inches	30 inches	\$ 3.60
12	$\frac{7}{8}$ "	30 "	4.50
14	1 "	30 "	5.40
16	$1\frac{1}{4}$ "	30 "	7.80
18	1 "	72 "	9.60
20	$1\frac{1}{4}$ "	72 "	12.00
25	$1\frac{1}{2}$ "	72 "	17.00

ANY DIAMETER OR TAKE-UP TO ORDER

For other Turnbuckles see index.

**GIBSON GUY GRIPPER**

A guy can be tightened in one-eighth the time usually consumed by old fashioned methods. Positively cannot slip, for the harder the strain the tighter the grip.

Size.	Number	1	2	3	4
For wire rope.....	diameter.....	$\frac{3}{8}$ inch and smaller	1 to $1\frac{1}{8}$ inch	$1\frac{1}{2}$ inch	2 inch
Price.....	each.....	\$10.00	\$12.00	\$16.00	\$24.00

Always give size of rope gripper is to be used on.

CABLE TRAMWAY ROLLERS**No. 17 Track Roller**

With bronze bearings. Size of roller 6x7 inches.
Price.....\$4.50 each

**No. 18 Curve Roller**

With oil reservoir in bearing. Size of roller 7x4½ inches. Price.....\$5.50 each

STEEL DERRICK SKIPS

For Handling Stone, Brick, Etc.

OAK DERRICK SKIPS

Dumps by pulling the trip line. Made of 2-inch oak. Well ironed. ½-inch short link chain.

Capacity Cu. Yards	Dimensions	Price, Irons Only	Price, Complete
1	5 ft. x 5 ft. x 14 in.	\$50.00	\$55.00
2	6 ft. x 6 ft. x 18 in.	67.50	75.00

We can also furnish irons complete for making wood stone boxes.

**Standard Size, 35 Cubic Feet**

The box is 5x6 feet with sides 14 inches deep and of No. 8 steel, well riveted and braced. The corners of steel angles 2x2x¼ inches, top band, 1¾x¾ inches. Chain bar steel, 2¼x¾ inches.

Three ½-inch diameter chains, each 5 feet long, with dumping trigger.

Weight, 700 lbs. Price, \$45.00 each.

Heavier skips of any size quoted upon request.

PIN AND COMMON LEWISES



Pin Lewises



Common Lewises

Pin Lewises

Nominal Capacity, Lbs.	Price Each	Nominal Capacity, Lbs.	Price Each
1,000	\$7.00	4,000	\$9.00
2,000	8.00	6,000	10.00

Common Lewises

Nominal Capacity, Lbs.	Size Number	Size Shackles, Inches	Size Pin, Inches	Price Each
2,000	1	3/8	1/2	\$7.00
3,000	2	1/2	3/8	9.00
5,000	3	5/8	3/4	12.00
7,000	4	3/4	7/8	16.00
10,000	5	7/8	1	20.00

PLUGS AND FEATHERS



Length, Inches	Hole, Inches	Price per Set
3	5/8	\$0.20
4 1/2	3/4	.25
6	7/8	.35
8	1	.50

Plugs and feathers from 10 to 40 inches long, made for any size hole.....\$0.15 per lb.

STEEL WEDGES FOR STONE



Hard Stone Wedges



Sandstone Wedges

Kind	Price per Pound
Hard Stone	\$0.15
Sandstone	.25

DRILLS
 For Stone, Marble and Granite
 Made of Fine Tool Steel

BALL DRILLS



Length	Approximate Weight	Price Each
7 feet	8 pounds	\$3.00

STAR DRILLS



Diameter	Length	Approximate Weight Each	Price	
			Each	Per Dozen
1/4 inch	8 inches	1/4 pound	\$0.60	\$ 6.00
3/8 "	10 "	1/2 "	.80	8.00
1/2 "	12 "	5/8 "	1.00	10.00
5/8 "	14 "	1 1/2 "	1.20	12.00
3/4 "	16 "	1 3/4 "	1.20	12.00
7/8 "	16 "	2 "	1.40	14.00
1 "	16 "	3 "	1.60	16.00

PIERCE HAMMER DRILL

For Drilling Holes for Expansion Bolts

**It saves the hands
of the operator.**

The chuck has a quick release, so the points can be changed instantly.

The drill points are star shaped and made of tool steel.



Hammer Drill and Extra Drill Points	Price Each
Hammer with one point..	\$10.00
Extra points:	
1/2 in. x 4 in.....	.75
5/8 " x 6 ".....	1.00
5/8 " x 12 ".....	1.25
3/4 " x 6 ".....	1.15
3/4 " x 12 ".....	1.40
7/8 " x 6 ".....	1.25
7/8 " x 12 ".....	1.50

STEEL GRAB HOOKS AND CHAINS



Nominal Capacity, Tons	Size Chain, Inches	Length Chain, Feet	Price Complete
2½	½	10	\$12.50
5	¾	14	20.00
10	¾	16	27.50
15	1	18	40.00
25	1¼	20	70.00

The nominal capacity cannot be guaranteed under all conditions, either in the hooks or chains. A very wide spread with a short chain may exert strains many times in excess of the load.

The chain is of the finest grade BBB chain and the hooks are made of solid steel.

STEEL DERRICK FOOT HOOKS AND CHAINS

BBB Chain and Solid Steel Hooks



Nominal Capacity, Tons	Size Chain, Inches	Length Chain, Feet	Price Per Set
2½	½	5	\$14.00
5	¾	7	18.00
10	¾	10	25.00
15	1	15	30.00

STEEL DERRICK GRAB HOOKS



Nominal Capacity, Tons	Size Iron	Weight, Pounds, Each	Price Per Set of Two Hooks
2½	1 x3	18	\$ 9.00
5	1 x3½	30	13.00
10	1½ x4	45	17.50
15	2 x5	75	22.50
25	2 x6	125	37.50

STONE SETTERS' GRABS



Nominal Capacity, Tons	½	¾	1¼	2	3	Price, Each
"	"	"	"	"	"	\$ 7.00
"	"	"	"	"	"	7.50
"	"	"	"	"	"	10.00
"	"	"	"	"	"	13.00
"	"	"	"	"	"	18.00

We can furnish these grabs suitable for granite or marble if so desired.

STONE TONGS



No. 15



No. 16

Can furnish promptly any capacity. State width of opening and maximum capacity. Prices quoted upon request.

BEAM CLAMPS



No.	Capacity, Tons	Maximum Size of "I" Beam, Inches	Price
10	1	10	\$10.00
11	2	15	12.00
12	3	20	15.00

Lifting Clamps of any capacity or design made to order.

THE CHANNON PATENTED SCRAPER BUCKET EXCAVATOR OR ROTARY LAND DREDGE

**For Digging Waterways, Building Levees, Making Railroad Cuts and Fills, Digging Ore
from Open Cut Mines, Loading Cars, Stripping Mineral Beds, Digging and Back-
Filling Sewers and Trenches, for Use in Gravel and Sand
Pits, or for Handling Loose Material of Any Kind**

The Channon Scraper Excavator, briefly described, consists of an upper platform or turntable, rotating upon a lower or skid frame, moving upon maple rollers, using planks laid on the ground for runway.

The long boom and machinery are placed on the upper platform, which revolves like a locomotive crane on eight or more track wheels, having shafts attached to an outer circular band and radiating to a slip ring sliding between the top and bottom center castings, making a perfect roller bearing.

These track wheels or rollers travel between two circular T-rail tracks. Around the lower rail circle is passed the wire ropes for turning the upper platform, which rotates opposite to and counter weights the bucket and load.

The patented scraper bucket is hauled *toward* the machine, moves (by its own power) on the maple rollers *away* from the cut.

As machine rotates in a complete circle it will, of course, dig and automatically discharge material on any side, as well as front and rear.

All operating levers are banked in quadrant at front of machine, where the engineer has an unobstructed view of the cut.

Machine will handle economically material that *can not* be plowed readily by four horses; the engines and boiler are amply large for even harder digging, but, of course, the capacity is then reduced very materially. We do not recommend our excavator for rock, hard pan, shale clay, cemented gravel, or the like, though it will handle such material after it has been blasted.

When writing, be sure to mention size of cut, character of material and general conditions of the work.

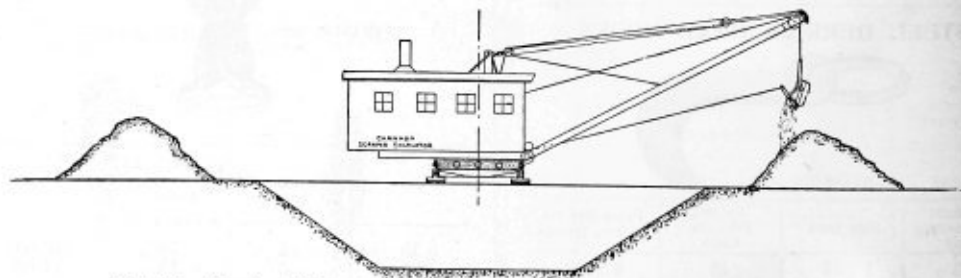
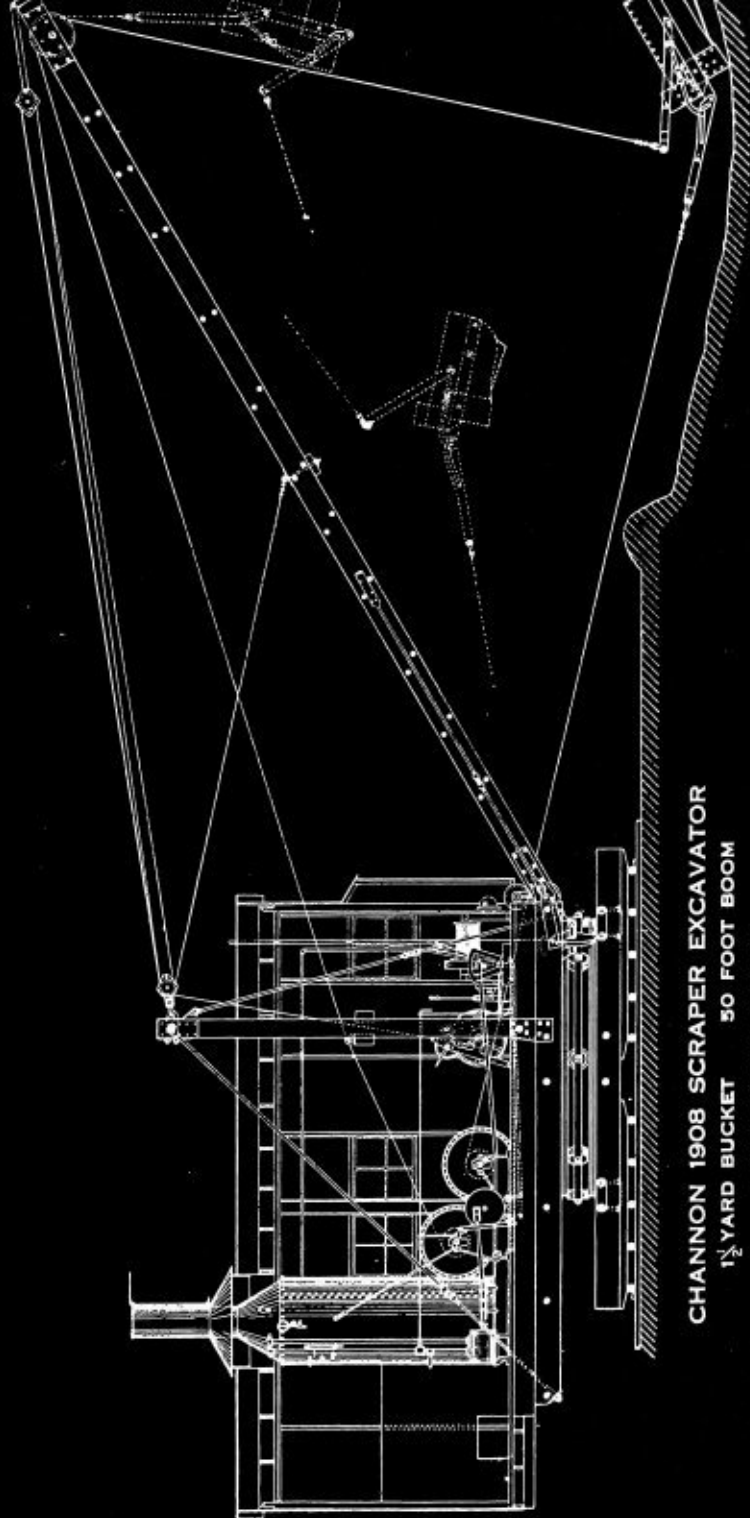


Fig. 12.—Digging Water Ways, wasting the material on one or both sides
Machine is on ground level

Send for Catalog No. 37, completely describing the Channon Scraper Excavator



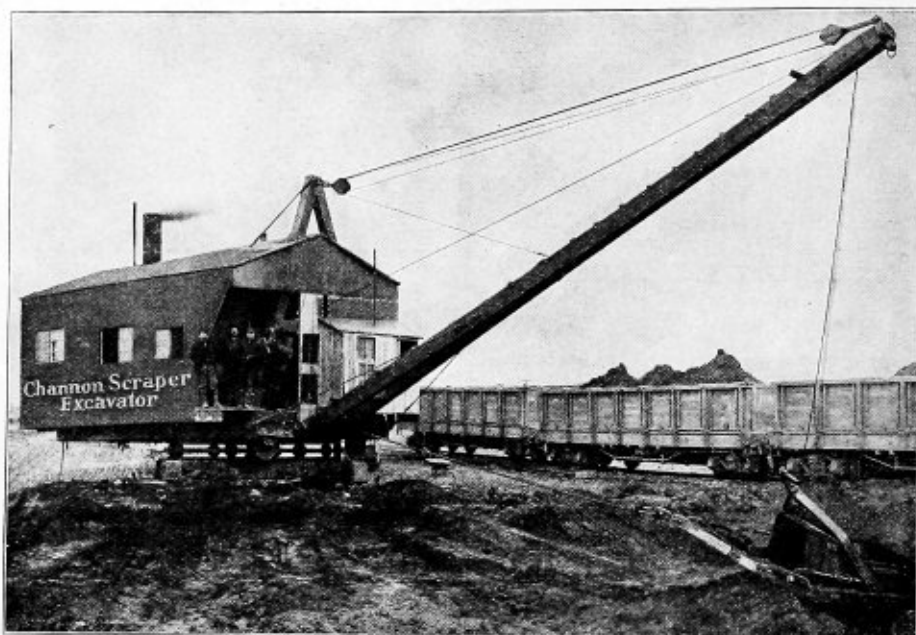
CHANNON 1908 SCRAPER EXCAVATOR

1½ YARD BUCKET 50 FOOT BOOM

MANUFACTURED BY

H.Channon Company: Chicago.

THE CHANNON SCRAPER EXCAVATOR



GENERAL SPECIFICATIONS

SCRAPER BUCKET.....	Cap. 1½ cu. yds.
MAIN ENGINE, Special Mundy, with large Frictions and Gearing. }	9x10 Double Cylinders, Double Friction Drums
BOILER, Vertical, High-pressure, with Jerrold Tube Setting. }	50 in. diam., 102 in. high
SWINGING ENGINE, Special Mundy, Compound Geared. }	155—2 in. diam. Tubes
	5x8 Double Cylinders, Link-rev. Motion
WINCH, Iron Frame, Screw Brake.....	Double Purchase
WIRE ROPE, Bullock Brand.....	Plough Steel
DIAM. RAIL CIRCLES, center to center of T-rails.....	13 ft.
BOOM, length center to center.....	50 ft.
DIGGING RADIUS, from center of machine boom at 30°.....	50 ft.
WIDTH of machine.....	14 ft.
LENGTH of skid frame.....	22 ft.
LENGTH of turntable platform.....	29 ft.
HEIGHT of "A" frame.....	18 ft.
CLEARANCE HEIGHT under boom at 30°.....	30 ft.
boom point to ground level, boom-at 60°.....	48 ft.
SIZE of load Orange-peel or Clam-shell }	1½ yd.
Bucket will handle in average earth. }	
WEIGHT, Machinery and Iron-work.....	APPROX. 45,000 lbs.
" Timber.....	" 46,500 lbs.
" Complete Machine, in running order.....	" 50 tons
CAPACITY, in average earth.....	APPROX., 750 yds. in ten hours

With a 50 ft. boom set at an angle of 30 degrees, machine will dig at any point in a circle, 100 ft. in diameter.

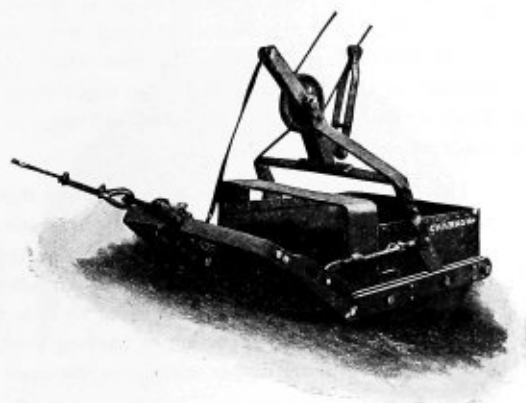
Send for Excavator Catalog No. 37

CHANNON IMPROVED ADJUSTABLE AUTOMATIC POWER SCRAPER

Patent No. 832894—Oct. 9-'06
 " " 867917—Oct. 15-'07
 " " 868595—Oct. 15-'07
 Others pending

This Bucket is **locked** when in carrying position and **no tension on drag line** is required in hoisting or dumping.

Dump is automatic and positive at any predetermined point.



Digging



Carrying Position

These are the buckets used with our Improved Channon Scraper Excavators; the back drum of the engine is used for hoisting the bucket and the front drum for pulling it toward the machine.

The bucket has a simple locking device on front bail which holds the bucket at proper carrying angle **without tension** on the drag line.

The bucket dumps automatically as soon as the vertical arms shown engage the dumping stop attached to the hoisting rope; when these arms strike the stop the horizontal lever is pushed downward, which raises the front bail and unlocks it, allowing the bucket to dump its load.

By adjusting the turnbuckle connecting rod between the bails of the bucket, a change in leverage is obtained, so that the point of the bucket is made to take a deep cut for soft digging or a very shallow cut for hard material.

The back end of the pan is rounded so that clay and sticky materials may be more readily discharged. Bucket will dig equally well in **wet ground** or **under water**.

Sizes in cubic yards..... 3/4 1 1 1/2 2
 List prices..... \$550.00 \$625.00 \$875.00 \$1,000.00

Cutting edge of bucket is reinforced and sharpened. Teeth for hard digging can be put on if desired.

Send for Catalog No. 37 describing above scrapers



Dumped

Specifications for Hayward Buckets

ORANGE-PEEL TYPE

The Hayward Orange-peel Bucket is constructed with three or more curved triangular blades, and when closed forms a tight semi-spherical bowl, which contains the excavated material.

When open, the blades resemble sharp spades, and are so adjusted that the maximum digging effect is produced, with but a slight tendency to lift the bucket while closing.

Horizontal arms are riveted to the blades, and their inner ends are attached to a central block or casting with suitable bolts, having special bushings for reducing the wear, while the outer ends are hinged to the vertical connecting rods, which are pivoted at their upper ends to the upper center block or casting.

The power wheel for closing the bucket is secured to the lower central casting, and is eccentric in shape, so that it gives its maximum power just as the bucket commences to close. It is well braced and the shaft is extended on either side to receive the cams, to which are attached the two power chains. An idler sheave is attached to the upper casting to deflect the closing chain, the supporting or backing chain being attached to the upper casting on the opposite side.

The materials used are of the best quality. The blades, blade arms, and connecting rods are of flange steel. The upper and lower center blocks are substantial castings. All bolts and pins are of Norway iron, and their bushings are of steel, or of bronze if so ordered. The power-wheel bearings are phosphor-bronze. All similar sections and parts of buckets are interchangeable and are numbered and lettered, a reference to which, with the number of the bucket which will be found on the power-wheel frame, being all that is necessary in ordering any part. The standard blades for all buckets have removable cast-steel points, which add greatly to the life of the blades.

A new feature of the 1907 bucket is the oscillating head, which allows the bucket to hang central under all conditions. These heads are now used on all styles of Hayward Orange-peel Buckets.

Power wheels are made to operate by wire rope or chain. Guards for both are shipped with buckets without charge.

CLAM-SHELL TYPE

The Hayward type of Clam-shell Bucket is made of two shells, or blades. Vertical arms are riveted on either side of the blades, and their upper ends are connected to the main shaft on which the power wheel for closing the bucket is located. The outer ends of the blades are fitted with lugs which receive vertical connecting rods, which are pivoted at their upper ends to the upper center block or casting. The power wheel and cams are made of one casting.

The upper center casting is so constructed that the four connecting rods work from one center, allowing the casting to oscillate and the bucket to hang central under all conditions. An idler sheave is attached to the upper casting to deflect the closing chain, the supporting or backing chain being attached to the upper casting on the opposite side.

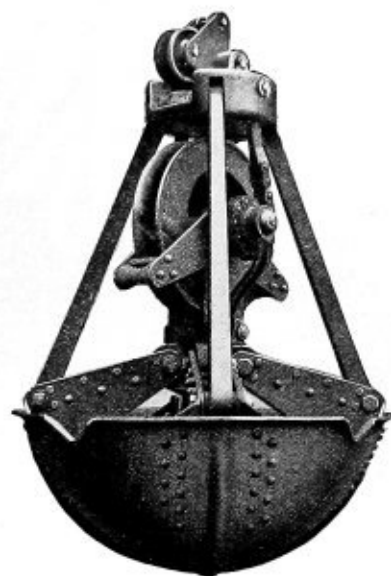
The materials used are of the best quality. The blades and blade arms are of flange steel, the upper center and power wheel are substantial castings, the connecting rods are of steel, and all bolts and pins are of Norway iron.

All similar sections and parts of the buckets are interchangeable, and are made on the duplicate part system and are bushed throughout with phosphor-bronze bushings, which can be replaced when worn, without the aid of a mechanic.

All styles of Clam-shell Buckets are so constructed that either wire rope or chain may be used for operating. In ordering, state whether chain or rope is to be used, so the proper power wheel and guards may be furnished.

The shoes are made of plate steel so constructed that they form a shoulder on either side of the blades. They are riveted to the blades and may be easily replaced when worn.

HAYWARD STANDARD ORANGE PEEL BUCKETS



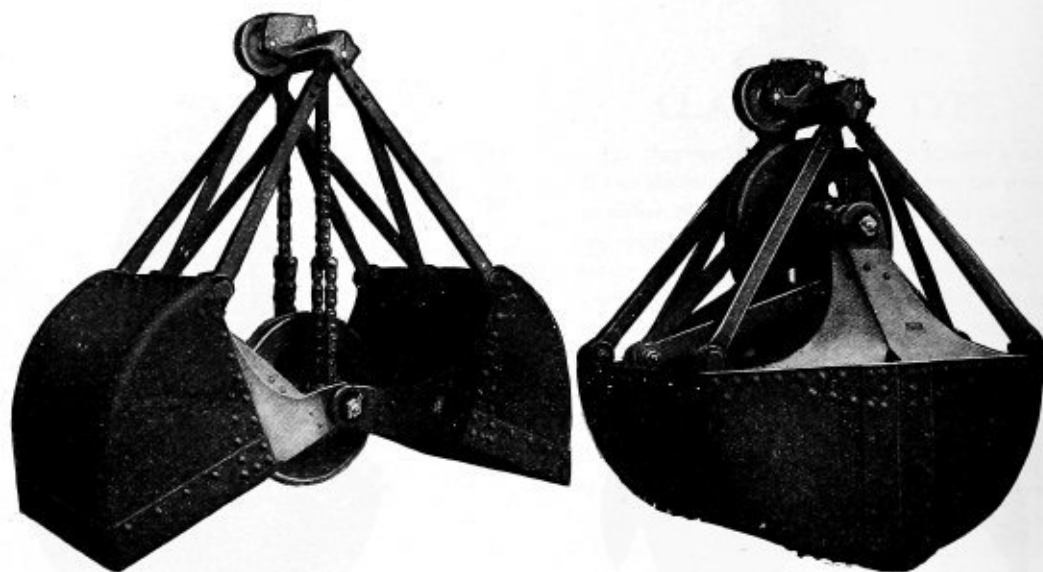
STANDARD ORANGE PEEL BUCKETS

Capacity	Approximate Weight in Pounds	DIMENSIONS CLOSED		DIMENSIONS OPEN		List Price Each
		Diameter Feet Inches	Height Feet Inches	Diameter Feet Inches	Height Feet Inches	
1 cubic foot	125	1 9	2 6	2 2	2 10	\$ 175.00
2½ cubic feet	450	2 6	3 9	3 2	4 3	250.00
5 cubic feet	900	3 2	4 9	4 0	5 4	450.00
7 cubic feet	1,000	3 6	5 0	4 3	5 8	475.00
9 cubic feet	1,100	3 10	5 2	4 8	5 10	500.00
12 cubic feet	2,150	4 3	6 4	5 0	7 0	725.00
15 cubic feet	2,350	4 6	6 6	5 6	7 3	775.00
21 cubic feet	3,750	5 0	7 9	6 4	8 6	1,000.00
1 cubic yard	4,200	5 8	8 0	6 10	9 0	1,050.00
1¼ cubic yards	4,750	6 0	8 3	7 3	9 6	1,200.00
1½ cubic yards	5,250	6 4	8 8	7 8	10 0	1,350.00
1¾ cubic yards	7,250	6 4	9 6	8 0	10 9	1,500.00
2 cubic yards	8,500	7 0	10 0	8 6	11 3	1,750.00
2½ cubic yards	9,500	7 8	10 4	9 4	11 9	1,950.00
3 cubic yards	10,000	8 0	10 8	9 10	12 3	2,150.00

Sizes up to 1½ cubic yards carried in our Chicago stock.

For Description See Preceding Page

HAYWARD CLASS "E" CLAM-SHELL BUCKETS

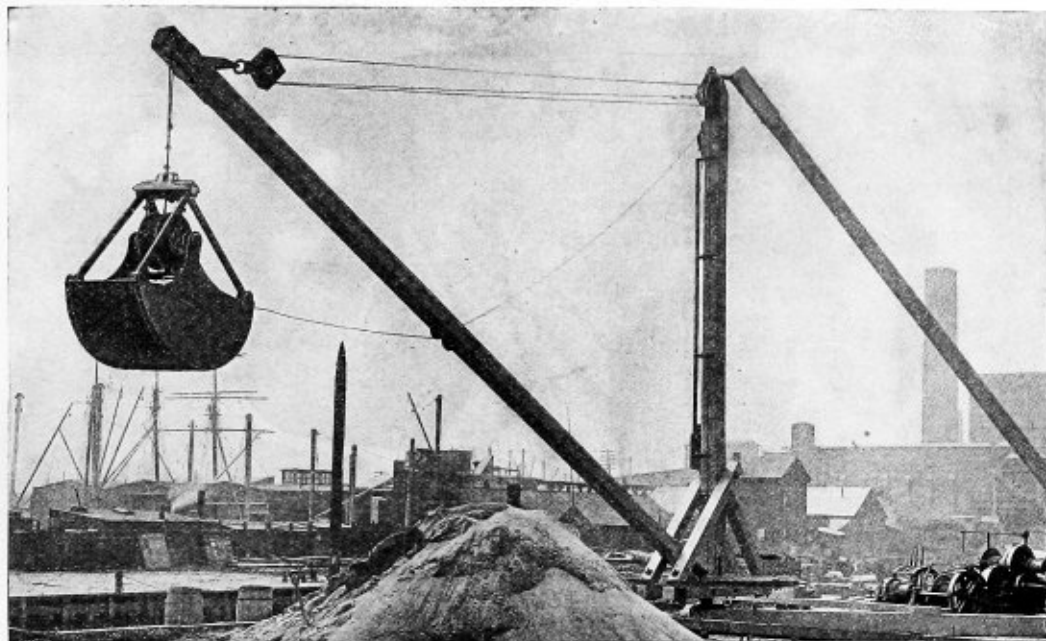


CLASS "E" CLAM-SHELL BUCKETS

Capacity	Approximate Weight in Pounds	OPEN						List Price, Each
		Width		Height		Length		
		Feet	Inches	Feet	Inches	Feet	Inches	
½ cubic yard	2,100	3	3	5	10	5	7	\$ 600.00
¾ " "	2,350	3	3	6	10	6	10	700.00
1 " "	2,600	3	3	7	8	7	6	800.00
1½ " "	3,800	3	9	8	6	8	6	950.00
1¾ " "	4,000	4	0	8	6	8	6	1,000.00
2 " "	4,750	5	0	8	6	8	6	1,200.00
2½ " "	5,800	5	0	9	9	9	9	1,450.00
3 " "	6,500	6	0	9	9	9	9	1,700.00
4 " "	9,000	6	0	10	9	11	0	2,250.00
5 " "	11,000	7	0	11	3	11	0	2,800.00

Sizes up to and including 1½ cubic yard carried in our Chicago stock.

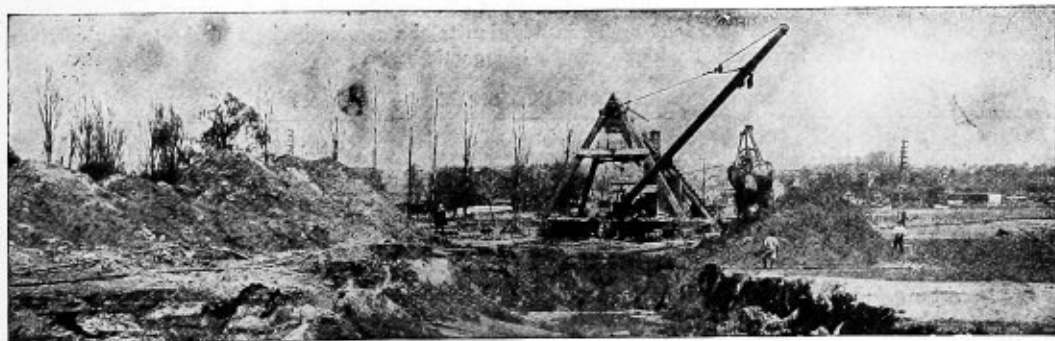
For Description See Preceding Page.



GRAB BUCKET DERRICKS AND EXCAVATORS

All Types and Sizes

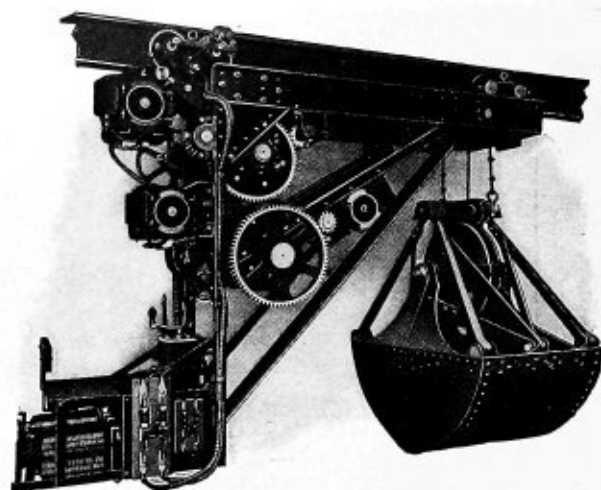
When inquiring for prices be sure to state size of bucket and capacity wanted, length of boom and nature of material to be handled.



ELECTRIC GRAB BUCKETS

For
Direct or
Alternating
Current

Entirely
Weather
Proofed



For use on
Mono-rail,
Overhead
Bridge, or
Gantry
Crane

Single I Beam or Mono-rail Outfit

For loading and conveying loose materials, such as coal, sand, ore, crushed stone, etc., in power plants, cement mills, unloading docks, coaling stations, fertilizer plants and the like.

Will handle materials very economically as they are ready to start instantly and use power only when in operation.

Crane has swivel trucks, enabling it to go around curves of short radius.

Three motors are used, two to handle the bucket, one to close, the other to hold it; both motors are utilized in lifting; the third motor handles the trolley; each motor is positively geared to the hoisting mechanism.

Operated by two controllers mounted in operator's cage, one controller handling the two bucket drums, the other the trolley motor. If the bucket is closed and at its highest point of lift, turning the controller handle one notch forward opens the bucket, one more notch lowers it, still another notch closes it, and advancing the lever to the next notch hoists the bucket, thus completing the cycle of operation which is always continuous in one direction.

The control is entirely electrical and the controllers can be located as far away from the hoists as may be desired, it being only necessary to run electric wires or conductors from the controllers to the hoists, an entirely new feature in grab bucket control, the advantages of which are at once apparent.

The motors are running only when the load is being lifted or lowered, or the bucket is being opened or closed, the power required to lift a given amount of material being much less than when the motors are running continuously—the usual method of operation.

Each hoist is provided with a load brake, in addition to the service brake and the trolley carriage of the Mono-rail Crane is provided with a standard magnetic brake.

STANDARD SIZES

Size of Bucket	Capacity Including Bucket, Lbs.	Weight with Empty Bucket, Lbs.	Lift, Feet	Speed of Travel, Feet per Minute
$\frac{3}{4}$ cu. yd. coal	3,500	10,800	50	350 or 700
1 cu. yd. coal	4,000	11,000	50	350 or 700
$1\frac{1}{2}$ cu. yd. coal	6,000	13,000	50	350 or 700

In writing for information and prices we must know current and voltage, radii of curves, kind of material and general conditions of operation.

COAL BUCKETS

Self-Dumping and Self-Righting—Side
or Back-Lever CatchSide-Catch
Buckets

Back-Lever Catch Buckets

These buckets are designed to secure strength and durability, with easy handling, rapid filling, quick dumping and righting, and a free discharge.

Strong steel brackets are fastened to bottom of the buckets, which carry large, wide wheels containing self-oiling bearings. The wheels are rounded on the edges to facilitate the turning of the buckets, and of sufficient diameter to give ample clearance for the bottom of the bucket to pass over pieces of coal.

The trunnions are large and well formed, and are located to insure a perfect balance, thereby permitting the bucket, when the catch is unfastened by the operator, to quickly dump its load and immediately right and lock itself to the bail automatically.

Smaller Sizes

Larger Sizes

Coal Cap., Lbs.	Cap., in Cu. Ft.	Weight, Lbs.	Price Each		Coal Cap., Lbs.	Cap., in Cu. Ft.	Weight, Lbs.	Price Each
280	5 3-5	157	\$27.00		800	16	440	\$ 65.00
320	6 2-5	160	28.00		850	17	445	67.25
370	7 2-5	170	29.25		900	18	460	69.50
400	8	195	31.50		1,000	20	485	72.00
400	8	255	35.75		1,120	22	510	73.00
450	9	210	32.00		1,200	24	525	81.00
500	10	230	35.75		1,300	26	565	95.00
500	10	285	38.50		1,500	30	660	105.00
560	11	310	40.00		1,750	35	785	112.00
600	12	330	48.00		2,000	40	835	114.00
600	12	385	53.00		2,240	44	860	121.00
650	13	390	54.00		2,500	50	920	145.00
700	14	400	57.50		3,000	60	1,050	170.00
750	15	420	61.00		3,360	67	1,175	180.00

In ordering, state weight of bucket wanted and style of catch

CLASS "B" CONTRACTOR'S DUMPING BUCKETS

Self-Dumping and Self-Righting



For Handling
Concrete, Mortar,
Stone, Sand, Clay, Etc.



Class "B" Number	Capacity in Cubic Feet	Width Over All in Inches	Length in Inches	Depth in Inches	Price, Each
97	3	28	26	15	\$ 25.00
98	5	31	28	18	27.00
99	6	31½	29	19	29.00
100	7	34	30	19	31.00
101	8	35	31	19	32.00
102	10	36	35	21	36.00
103	12	38	38	23	40.00
104	14	38	40	25	50.00
105	18	43	43	27	60.00
106	21	45	46	28	70.00
107	27	47	50	30½	84.00
108	36	52	54	33	94.00
109	41	54	58	36	103.00



Automatic Dumping Coal Bucket

This Bucket is used for Automatic Coal Elevators with inclined booms.

The Back-lever catch is extended forward underneath and clear of the bail, to operate as an automatic tripping device.

The Bucket is carried on a trolley, running on the inclined boom, and after it is raised the limit of its vertical hoist, while the trolley remains at rest, the further pull of the hoisting rope pulls the trolley with the Bucket up the inclined boom.

A roller attached to a movable hanger extends downward from the boom, and when the extended back-lever catch strikes the roller, it is released, and the Bucket automatically dumps its load.

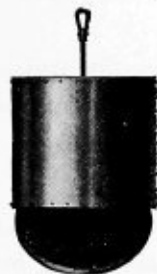
When the Bucket is empty, it rights itself to its former upright position, and the back-lever catch at the same time secures itself in place.

The design, workmanship, strength, durability and rapidity of action of these Buckets have no equal.

Size Number of Bucket	Coal Capacity in Pounds	Coal Capacity in Cubic Feet	Price, Each
57	370	7 2-5	\$ 32.00
58	450	9	35.00
59	560	11	42.00
60	750	15	65.00
61	1,120	22	82.00
62	1,500	30	110.00
63	2,000	40	125.00
64	2,240	44	130.00

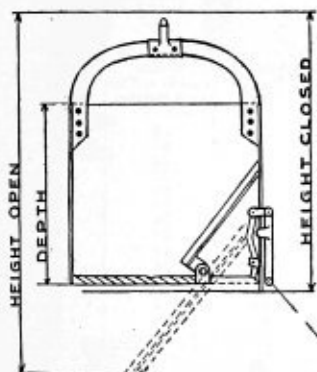
LONG'S PATENT BOTTOM DUMPING BUCKETS

Used by Railroads for Coaling Locomotives and by
Contractors for Handling Concrete, Broken
Stone and Other Rough Materials



These buckets are built of steel plates and are fitted with bottoms or doors, which are released by means of a line attached to the latch which is shown in illustration. The doors are counter-weighted and close automatically after the material has passed out.

The dump is easy and the lock positive. A rigid bail is usually used, but we can furnish, if required, with swinging bail.



Capacity Cubic Yds.	Weight	Diameter Ft. In.	Depth Ft. In.	Height		Price Each
				Closed Ft. In.	Open Ft. In.	
$\frac{1}{4}$	500	2 6	3 0	4 3	5 5 $\frac{1}{2}$	\$ 95.00
$\frac{1}{2}$	750	3 1 $\frac{1}{2}$	2 10 $\frac{1}{2}$	4 5	6 2 $\frac{1}{2}$	115.00
1	825	3 1 $\frac{1}{2}$	3 10	5 4 $\frac{1}{2}$	7 2	155.00
1 $\frac{1}{2}$	1300	3 10	3 6	5 1	6 10	195.00
1 $\frac{1}{2}$	1400	3 10	4 2	5 9	7 6	230.00
2	1600	4 6	3 10 $\frac{1}{2}$	6 5	8 5 $\frac{1}{2}$	270.00
2 $\frac{1}{2}$	1650	4 6	4 4	6 10 $\frac{1}{2}$	8 10 $\frac{1}{2}$	310.00
2 $\frac{1}{2}$	1700	4 6	4 9 $\frac{1}{2}$	7 4	9 4	345.00
3	1850	5 0	4 7	7 1	9 9	385.00
3 $\frac{1}{2}$	1950	5 0	5 4	7 10	10 6	425.00
4	2000	5 0	6 0 $\frac{1}{2}$	8 7	11 3	460.00

When figuring Coal Capacity, figure 50 lbs. of coal to cubic foot or 40 cubic feet to ton; i. e., a 1 $\frac{1}{2}$ cubic yard bucket will hold 1 ton coal, etc.

ROUND TURN-OVER BUCKETS

The accompanying illustration shows our Round Bucket, which is used for handling all sorts of material. It is built of steel and iron and the bottom is made of stock double the thickness of the sides, thereby equalizing the wear. To secure stiffness and strength the bottom and sides are joined by an angle iron ring.



Size No. of Bucket	Coal Capacity in Pounds	Capacity in Cubic Feet	Width Over All in Inches	Height from Bot- tom of Bucket to Top of Bail	Depth of Bucket in Inches	Weight of Bucket in Pounds	Price
134	300	6	31	37	21	150	\$25.00
135	400	8	34 $\frac{1}{2}$	41	22	175	31.25
136	550	11	39	44	22	220	37.50
137	700	14	44	49	25	285	43.75
138	850	17	46 $\frac{1}{2}$	51	26 $\frac{1}{2}$	320	50.00
139	1050	21	48	56	30 $\frac{1}{2}$	416	56.25
140	1350	27	50 $\frac{1}{2}$	60	33 $\frac{1}{2}$	500	68.75
141	2100	42	58 $\frac{1}{2}$	71	40	750	93.75

H.Channon Company.Chicago.

"EXCELSIOR" CONCRETE BUCKETS



A slight upward pull on the Handle Bar dumps the Bottom and discharges the contents. A downward pull quickly closes and locks it in place until again released. No Springs.

They are made of only the best materials and constructed with the most modern devices for opening and closing the bottom doors.

No.	Cap., Cu. Ft.	Weight, Lbs.	Price, Each	Length of Top, Inches	Length of Bottom, Inches	Depth, in Inches	Height to Top of Bucket	Height to Top of Bail	Width Inside at Top and Bottom	Width Over All
500	3	175	\$ 65.00	20	12	18	20	23	19	24
501	7	360	80.00	29	18	25	27	32	27	33
502	10	450	95.00	34	22	27	30	35	29	35
503	12	500	105.00	35	23	28	31	36	30	36
504	14	575	120.00	40	27	28	31	40	30	37
505	18	650	130.00	43	29	30	33	42	32	38
506	21	745	140.00	46	31	31	34	44	36	43
507	27	850	150.00	48	33	33	36	47	36	43
508	34	1,025	183.00	53	37	36	39	50	41	48
509	41	1,150	200.00	58	40	39	42	53	45	53
510	54	1,650	265.00	60	42	41	44	59	51	62
511	63	1,700	280.00	61	42	42	45	60	52	63
512	67	1,775	290.00	61	43	42	45	60	54	65
513	75	2,070	300.00	61	43	42	45	65	60	71
514	85	2,300	325.00	67	49	44	48	72	60	71

"CYCLOPEAN" BOTTOM DUMP- ING CONCRETE BUCKETS

Bottom Latched, with Springs Operated by a Lever
Pulled Downward

Buckets especially designed for handling concrete are made funnel-shape, so that when the bottom is released the entire load or contents is dumped or placed in a concentrated mass, right on the spot.

Sizes and Prices

Capacity, Yards	Height, Inches	Width at Top, Inches	Width, at Bottom, Inches	Weight, Lbs.	Price, Each
1/2	28	34	26	460	\$ 75.00
3/4	35	37	27	560	81.25
1	36	44	30	850	93.75
1 1/2	42	48	35	1,240	125.00
2	42	60	36 1/2	1,380	156.25
2 1/2	48	56	40	1,794	193.75
3	48	64	45	2,085	231.25

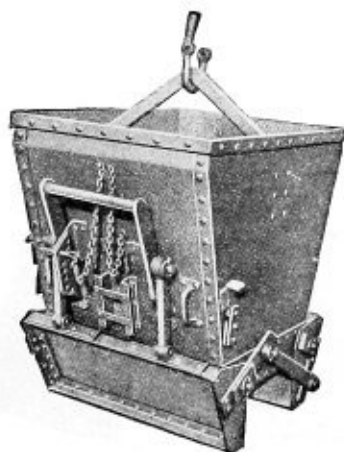
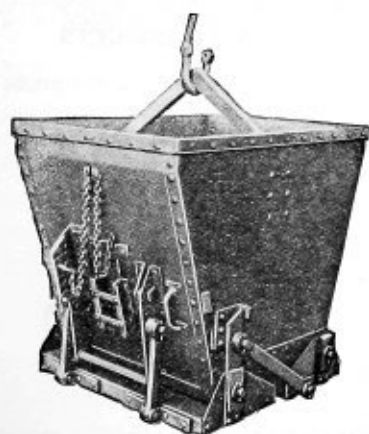
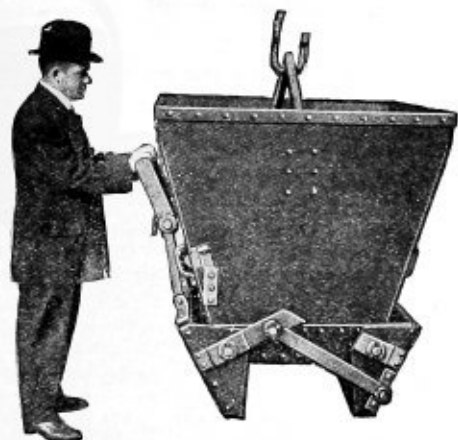
Chain Bail furnished if desired.

In ordering, state style of Bail wanted.



THE "STUEBNER" CONTROLLABLE CONCRETE BUCKET

Patented



This bucket was especially designed for placing concrete into narrow forms (up to 6 inches). It also makes an ideal spreader for floor slabs etc. Furnished with a device to regulate the drop of the doors, permitting the latter to be opened up to widths from 4 to 18 inches. The operating mechanism is very powerful, it is possible to allow some of the concrete to run out and to check the flow of the remainder.

Sizes and Prices

CAPACITY		Price Each	Weight, lbs.	WIDTH, INCHES				LENGTH, INCHES		DEPTH, inches	Height to Top of Bail	Total Height with Doors open
Cubic Yards	Cu. Ft. Even Full			of Top, inside	of Bottom, inside	over Bottom Doors	over all	of Top and Bottom, inside	over all			
1/2	14	\$120.00	695	44	23	33	46	28	36	34	43	48
3/4	25	140.00	850	48	23	33	50	33	42	38	47	54
1	31	150.00	1000	48	24	33	51	35	45	42	51	58
1 1/4	39	183.00	1200	48	24	33	51	39	48	46	57	64
1 1/2	48	200.00	1700	48	24	33	51	48	57	47	58	65
2	60	265.00	2100	48	24	36	51	54	64	52	65	72

Larger buckets or special size buckets built to order

STANDARD ORE BUCKETS



Fig. 154
Top Swing

The sides and bottom are made of best quality steel plate pressed into shape by hydraulic pressure.

The rivets are countersunk, and the sides are of such shape that no part can catch upon the timbering or sides of shaft.

The bottom of the Fig. 154 Bucket is "dished," so that the ring to which the dumping chain is attached does not interfere with the bucket standing fairly on the ground.

All banded around top. Strips on sides can be furnished at extra price.



Fig. 153
Center Swing

Size, No.	Height, Inches	Diameter, Inches			Thickness of Steel	Capacity		Weight, Pounds	Price, Each	
		Top	Center	Bottom		Cubic Feet	Lbs. Ore		Fig. 154	Fig. 153
1	30	21	24	17	No. 11	6½	750	140	\$20.00	\$22.00
2	32	24	27	21	No. 8	9	1,100	220	30.00	33.00
3	37	24	28	22	¼ inch	11	1,300	340	48.00	53.00
4	37	28	34	23	¼ inch	15	1,700	390	60.00	66.00

STRAIGHT SIDE MINING BUCKETS

Used in Lead and Zinc Districts



These buckets are made of heavy steel plates, and re-enforced with a band at the top.

The bail and trunnions are heavy, while the catch is strong, reliable and simple in operation.

Number Bucket	Coal Cap., Lbs.	Cap., Cu. Ft.	Diam., Inches	Depth, Inches	Price, Each
142	300	6	22	28	\$21.75
143	400	8	25	30	27.50
144	500	10	26	32	33.75
145	600	12	28½	33	36.25
146	700	14	30	35	40.00
147	800	16	32	35	46.25
148	1,000	20	34	40	56.25
149	1,200	24	35	43	58.75
150	1,500	30	37	48	66.25

WATER BUCKETS



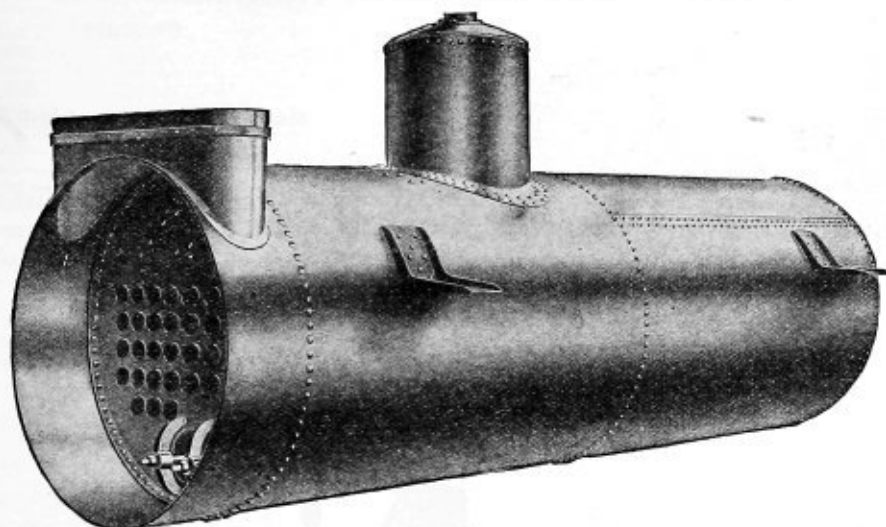
Of the most approved pattern. Wrought iron strips are riveted to sides, providing wearing surface when used in incline shafts and making the sides perfectly smooth.

Bucket has a stiff bail and a valve in the bottom, the stem of which projects below the bottom and automatically opens when it touches the bottom, and closes it again as soon as raised.

Capacity, Gallons	40	50	75	100	125	150	200	300
Length, in.	36	40	48	52	56	60	66	72
Diam. middle	20	21	24	26	28	30	33	38
Diam. ends..	16	17	19	21	23	24	26	30
Weight, lbs.	100	175	300	350	400	520	700	850
Price, net...	\$30	\$40	\$60	\$70	\$80	\$95	\$125	\$145

STANDARD HORIZONTAL TUBULAR BOILERS

For 100 lbs. Working Pressure. Made with 3, 3½ or 4 inch Tubes



GENERAL SPECIFICATIONS OF OUR STANDARD HORIZONTAL TUBULAR BOILERS

Shells—The shell and heads are made of open hearth flange steel, 60,000 pounds tensile strength, the physical and chemical properties of which conform to the standard adopted by the Association of American Steel Manufacturers. The shell of all boilers 16 feet long and less is made of two plates, over 16 feet long of three plates, each plate forming the entire circumference of the boiler, with only one horizontal seam, and that in the upper quarter of the shell well above the fire line.

Tubes—All tubes are lap-welded steel. We are prepared to furnish genuine charcoal-iron or seamless steel tubes when required. The tubes are properly expanded in the heads and beaded over at both ends.

Dome—The boiler shown above is provided with a fixed dome, but when desired we will furnish a detachable dome, dry pipe or baffle-plate, or make the boiler without any of these fixtures.

Smoke-Box—The smoke-box is formed by extending the shell, and is fitted with a collar as shown in the illustration, or with a damper plate if preferred. When specially ordered we can make the smoke-box loose, to be attached to front head with bolts.

Fusible Plug—In the back head, 2 inches above top row of tubes, a soft-metal fusible plug is provided.

Riveting—All horizontal seams are lap joint, double riveted. Circular seams are single riveted.

Manholes and Handholes—Boilers 36 inches in diameter have manhole in top of shell and handhole in front head below tubes. Boilers 42 inches in diameter have flanged manhole in rear head above tubes and handhole in front head below tubes. Boilers 48 inches and larger in diameter have flanged manhole in rear head above tubes and in front head below tubes.

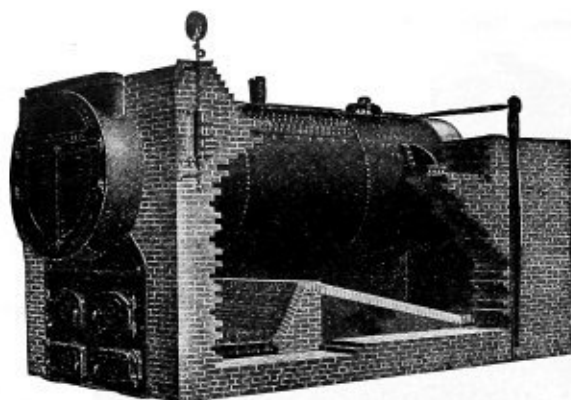
Supports—All boilers are regularly provided with four heavy cast iron lugs, but when preferred we will substitute pressed steel, removable shoe lugs or forged steel hanger loops without change in price.

Flanges—The safety valve or steam opening is reinforced with a forged steel flange, threaded for pipe connections; unless a flanged cast iron nozzle is ordered. When advised that a pop safety valve is to be used, we provide a separate screwed steel flange or cast iron nozzle on the top of shell.

Test—A cold-water test pressure of 150 pounds is applied to all our boilers designed and constructed for 100 pounds working pressure, and when requested we furnish a certificate of such test. When it is desired we furnish a policy of insurance in any of the reliable boiler insurance companies at a small extra charge to cover the cost.

H.Channon Company. Chicago.

STANDARD HORIZONTAL TUBULAR BOILERS



Half Front Setting
Boiler Supported on Walls

For 100 Pounds Steam Working Pressure

Made With 3, 3½ or 4 inch Tubes

Fronts for 36-inch boilers have only one fire-door and one ash-door, larger fronts have two fire-doors and and two ash-doors.

See
**General Specifications on
Preceding Page**

When asking for prices be sure to state:

Size and number

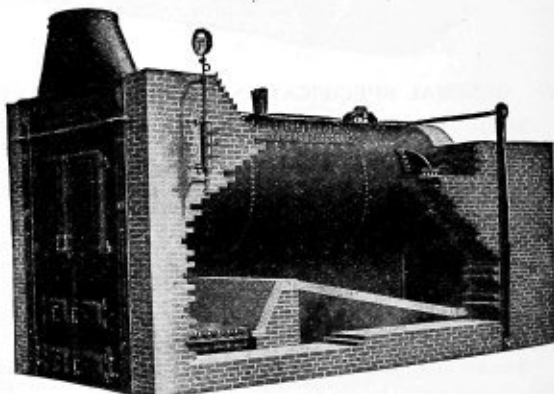
Whether half or full front Setting is wanted.

Style of grates.

See regular Complete Outfit below and state what extras are required.

Specify whether steam-dome, dry-pipe or baffle-plate is preferred.

Suspend Setting furnished at extra price.



Full Front Setting
Boiler Supported on Walls

COMPLETE OUTFIT

A regular "complete outfit" consists of boiler with front, common grates and rests, back arch bars, soot door and frame, stack with guy-wire six times length of stack, and trimmings consisting of water column, water gauge, three gauge cocks, steam gauge, lever safety valve, check and stop valves, and blow off cock. Buck bars and rods, fire door arches, wall plates and rollers are only furnished when specified, and at an extra price. Sheffield or Tupper grate bars are furnished instead of common grates without change in price. Fire tools, consisting of hoe, poker, and slice bar, are extra. With boilers 18 feet and over in length we furnish three sets of buck bars and rods for side walls; with all other lengths, two sets. When specified, we will furnish boilers without dome, or with dry pipe or baffle plate.

For Sizes and Specifications See Opposite Page

Specifications of Standard Horizontal Tubular Boilers

For 100 pounds working pressure

With dome. Flange steel in shell and heads.

Horsepower	15	20	25	30	35	40	45	50	60	70	75	80	90	100	115	125	150
Catalogue Number	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341
Diameter of Shell	36	36	36	42	42	42	48	48	54	54	60	60	60	66	66	72	72
Length of Tubes	8	10	12	10	12	14	12	14	14	16	14	16	18	16	18	16	18
Size of Tubes (regular)	3	3	3	3	3	3½	3	3½	3½	4	3½	4	4	4	4	4	4
Number of Tubes	24	24	24	39	39	32	46	32	44	36	54	44	44	54	54	70	70
Number of Tubes can be substituted without change of price	3½ in.	.....	.....	.....	.....	.....	.....	32	.....	44	.....	54	54	66	66	86	86
.....	4 in.	.....	.....	.....	.....	.....	26	26	36	.....	44	.....	.....	.....	.....	.....	.....
Thickness of Shell	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Thickness of Heads	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Diameter of Dome	18	18	18	20	20	20	24	24	27	27	30	30	30	32	32	36	36
Height of Dome	20	20	20	24	24	24	24	24	30	30	30	30	30	32	32	36	36
Width of Grate	36	36	36	42	42	42	48	48	54	54	60	60	60	66	66	72	72
Length of Grate	36	36	42	36	42	48	48	48	54	54	60	60	60	66	66	72	72
Diameter of Stack	16	16	16	18	18	18	24	24	26	26	28	28	28	32	32	36	36
Length of Stack	28	28	35	35	35	40	40	40	40	45	40	45	50	45	50	45	50
Gauge of Steel in Stack	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14
Size Lever Safety-Valve or Steam Supply	1½	2	2½	2½	2½	2½	3	3	3	3½	3½	4	4	5	5	5	5
Size Blow-off Cock	2	2	2	2	2	2	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½
Size Check and Stop Valves	¾	¾	¾	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½
Size Steam-gauge	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6

Weights with Full Fronts

Horsepower	15	20	25	30	35	40	45	50	60	70	75	80	90	100	115	125	150
Boiler only	2550	2950	3350	3800	4450	5100	5550	5950	7650	9000	9650	10800	11850	13300	14150	16600	18250
Full Front, Castings and Trimmings	1600	1600	1700	2150	2200	2300	2600	2600	3400	3450	3750	3800	4300	4650	4900	5150	5650
Stack and Guy-wire	450	450	550	550	550	650	900	900	950	1050	1250	1400	1550	1650	1800	1850	2100
Complete Outfit	4600	5000	5600	6500	7200	8050	9050	9450	12000	13500	14650	16000	17700	19600	20850	23600	26000

Weights with Half Fronts

Boiler with Smoke Doors	2750	3150	3550	4100	4750	5400	5950	6350	8100	9450	10300	11450	12500	14150	15000	17550	19200
Half Front, Castings and Trimmings	1150	1200	1250	1550	1600	1700	1900	1900	2100	2200	2400	2400	2900	3200	3450	3500	4000
Stack and Guy-wire	450	450	550	550	550	650	900	900	950	1050	1250	1400	1550	1650	1800	1850	2100
Complete Outfit	4350	4800	5350	6200	6900	7750	8750	9150	11150	12700	13950	15250	16950	19000	20250	22900	25300

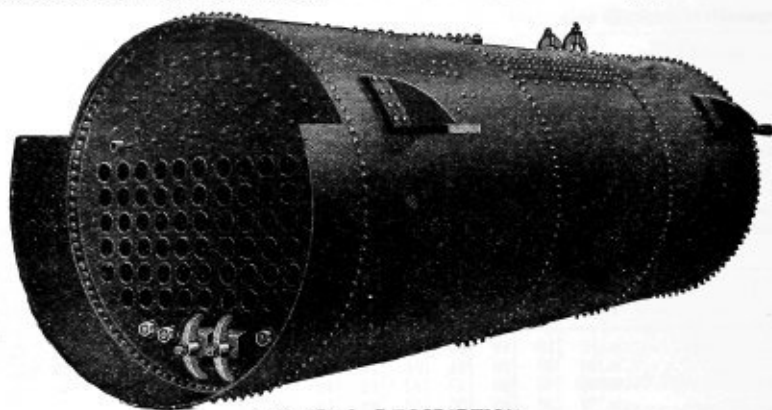
Weights of Extras and Changes

Pins-door Arches for Full Front ..	200	200	200	400	400	400	500	500	500	500	500	500	500	500	500	500	500
Pins-door Arches for Half Front ..	100	100	100	200	200	200	250	250	250	250	250	250	250	250	250	250	250
Back Bars and Rods for 1 Boiler ..	475	475	500	600	600	600	600	600	675	675	750	750	1000	825	1100	975	1300
For each additional Boiler add ..	150	150	175	200	200	200	200	200	250	250	250	250	300	250	350	300	450
Wall Plates and Rollers	75	75	75	75	75	75	75	75	75	75	75	250	250	250	250	250	250
Thicker Shell, for each ½ in. add ..	125	150	175	175	200	230	230	260	300	330	325	365	400	400	450	450	500
Thicker Heads, for each ½ in. add ..	45	45	45	60	60	60	75	75	90	90	120	120	120	150	150	170	170
For Three-quarter Front add to weight of Outfit with Half Front ..	150	150	150	175	175	175	250	250	600	600	650	650	650	650	650	800	800
If no Dome, deduct	200	200	200	250	250	250	350	350	500	500	550	550	550	700	700	900	900

HIGH PRESSURE HORIZONTAL TUBULAR BOILERS

For 125 and 150 lbs. Working Pressure.

Made with 3, 3½ or 4 inch Tubes



GENERAL DESCRIPTION

Shells—Open hearth fire-box steel is used for the shells and flange steel for the heads, all of which is made to conform to the standard adopted by the Association of American Steel Manufacturers and approved by all the reliable boiler insurance companies. All boilers 16 feet long and less are made of two plates, over 16 feet long of three plates, each plate forming the entire circumference of the boiler.

Tubes—Best lap-welded steel tubes are regularly furnished, but when required seamless steel or genuine charcoal iron tubes may be had.

Riveting—Boilers for 125 pounds working pressure, 54 inches and smaller in diameter, are made with the horizontal seams, butt joint double riveted; boilers 60 inches and larger in diameter, butt joint triple riveted. For 150 pounds working pressure butt joint triple riveted horizontal seams on boilers 48 inches and 54 inches in diameter; and for boilers 60 inches and larger in diameter, butt joint quadruple riveted horizontal seams. All rivet holes are punched small and then reamed to full size. The rivets are the best quality of mild steel. Wherever possible all rivets are driven by hydraulic machines.

Braces—All braces are of solid, forged, weldless steel, properly distributed to equalize the strain. All crow-foot braces are carried well back upon the shell, none less than 42 inches. The through braces below tubes have adjustable lock-nuts inside and outside of front head; the rear end is secured to a heavy steel crow-foot with a turned bolt and nut.

Manholes—All boilers are provided with a flanged manhole in front head below tubes and in top of shell.

Fusible Plug—In the rear head, 2 inches above top row of tubes, a soft metal fusible plug is provided.

Feed-Pipe—Each boiler is provided with an internal feed-pipe, extending from the front head to within two feet of rear head, thence across the boiler and down between tubes and shell; all securely supported from the braces.

Supports—All boilers are regularly provided with four heavy cast iron lugs, but when preferred we will substitute pressed steel, removable shoe lugs, or forged steel hanger lugs.

Test—All high pressure boilers subjected to a steady hydrostatic test pressure 50 per cent. in excess of the working pressure for which they are constructed, and when requested we furnish a certificate of such test. When it is desired we will furnish a policy of insurance in any of the reliable boiler insurance companies at a small extra charge.

SIZES

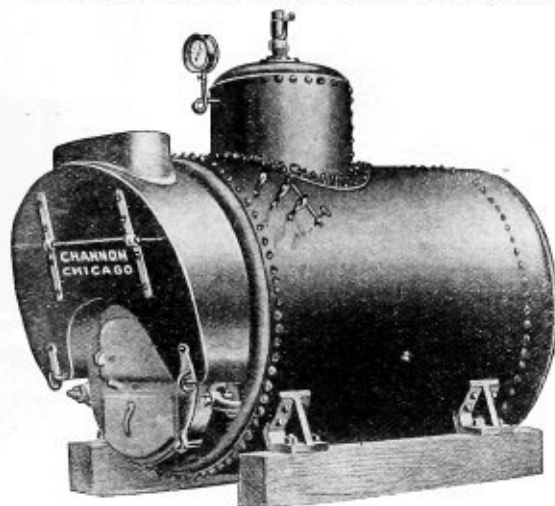
Horsepower.....	45	50	60	70	75	80	90	100	115	125	150	175	200	200	225
Diameter of Shell.....inches	48	48	54	54	60	60	60	66	66	72	72	78	78	84	84
Length of Tubes.....feet	12	14	14	16	14	16	18	16	18	16	18	18	20	18	20
Size of Tubes (regular).....inches	3	3½	3½	4	3½	4	4	4	4	4	4	4	4	4	4
Number of Tubes.....	46	32	44	36	54	44	44	54	54	70	70	84	84	92	92

A regular "complete outfit" consists of boiler with front, common grates and rests, back arch bars, soot door and frame, and trimmings consisting of water column, water gauge, three gauge cocks, steam gauge, pop safety valve, extra heavy check and stop valves, and blow off valve. Stack with guy wire six times length of stack is extra. Buck bars and rods, fire door arches, and wall plates and rollers are only furnished when specified, and at an extra price. Sheffield or Tupper grate bars are furnished instead of common grates without change in price. With boilers 18 feet and over in length we furnish three sets of buck bars and rods for side walls; with all other lengths, two sets. Fire tools, consisting of hoe, poker, and slice bar, are extra. When specified, we will furnish boilers with dome or with dry pipe or baffle plate at an extra price.

INTERNAL FURNACE PORTABLE TUBULAR BOILERS

For 100 lbs. Working Pressure

With Plain Riveted Furnaces and Dry or Brick Lined Combustion Chamber



Horse Power (as usually rated).....	20	25	30	40	50	60
Diameter of Boiler.....inches	48	54	60	66	72	78
Length of Furnace and Tubes....."	72	72	72	72	72	72
Depth of Combustion Chamber....."	25	25	25	25	25	25
Diameter of Furnace....."	24	26	28	30	34	38
Number of Tubes (all 2-inch).....	56	70	86	116	146	176
Square Feet of Heating Surface.....	200	248	301	397	498	595
Square Feet of Grate Surface.....	8	8½	10½	11¼	14½	15½
Length of Grates.....inches	48	48	54	54	60	60
Thickness of Shell....."	¾	1	1½	¾	1	1½
Thickness of Heads....."	1½	1½	1½	1½	1½	1½
Thickness of Furnace....."	1½	1½	1½	1½	1½	1½
Diameter of Dome....."	22	22	30	30	30	30
Height of Dome....."	24	24	30	30	30	30
Diameter of Smoke Stack....."	16	18	20	22	24	26
Length of Smoke Stack.....feet	24	24	24	24	24	24
Weight of Boiler and Fixtures.....	6000	6850	8350	9450	11500	13400

With the bare boiler is furnished legs and skids for support; No. 10 steel smoke box as shown by cut; shell extended at rear for combustion chamber, intended for fire brick lining (no brick furnished), with ¼-inch steel door on end with cleaning-out door near bottom; cast iron front and doors for end of furnace as shown by cut, with liner for fire door and dead plate for front support for grates; sheet iron ash door under front.

Man hole in shell and two hand holes in front head.

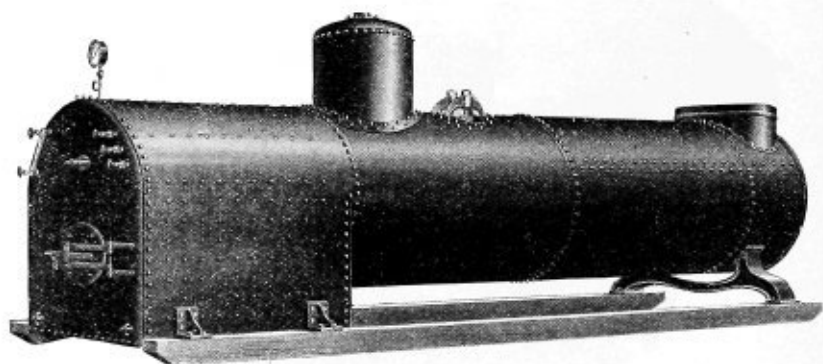
Furnace of first three sizes in one plate, others in two plates and are made with lap seams single riveted.

Longitudinal seams of shell, vertical and flange seams of dome double riveted; heads and girth seams single riveted; domes 22-inch diameter are single riveted to shell. Heads braced with through rods.

Fixtures Comprise: Grates the width of furnace with bearers; safety valve (ball and lever or pop); steam gauge with syphon and cock, water gauge and three gauge cocks attached direct to shell; blow-off valve, check valve and feed valve; smoke stack of No. 16 steel with galvanized guy wires (four times the length of stack).

PORTABLE LOCOMOTIVE OR FIRE BOX-BOILER

WATER FRONT—OPEN BOTTOM



These boilers are regularly constructed for 100 pounds working pressure, with water front and open bottom. When required we can make them with water bottom, also for 125 pounds working pressure. All boilers are subjected to a hydrostatic test pressure 50% greater than the working pressure for which they are built. Open-bottom boilers are made with wrought-iron mud-rings. The fire-door opening is formed by flanging the furnace sheet outward.

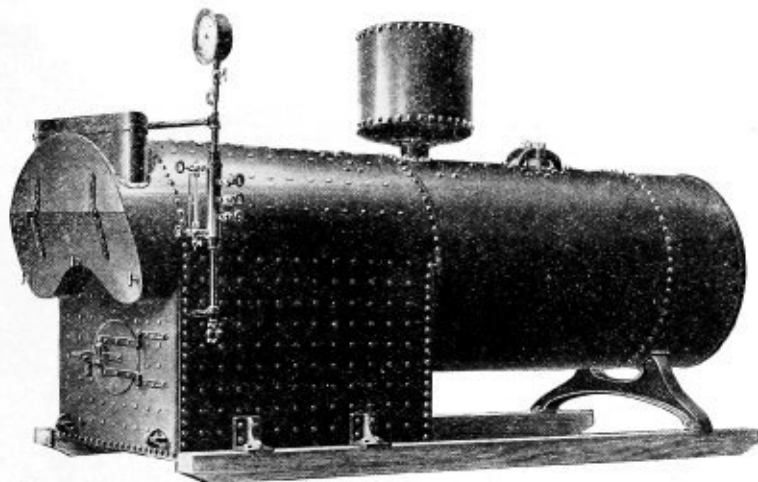
SPECIFICATIONS

Horsepower.....	15	20	25	30	35	40	50	60	70	80	90	100
Catalogue Number.....	615	616	617	618	619	620	621	622	623	624	625	626
Diameter of Boiler.....inches	32	32	36	36	42	42	48	48	54	54	60	60
Length of Fire-box.....inches	44	44	50	50	44	50	56	62	62	68	62	68
Width of Fire-box.....inches	26	26	30	30	36	36	42	42	48	48	54	54
Number of 3-inch Tubes.....	26	26	32	32	43	43	56	56	60	60	82	82
Length of Tubes.....inches	72	96	96	120	96	120	120	144	144	168	156	168
Diameter and Height of Dome.....inches	16	16	18	18	22	22	24	24	28	28	30	30
Thickness of Shell.....inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{11}{16}$	$\frac{11}{16}$
Thickness of Fire-box.....inches	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
Thickness of Heads.....inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Size of Lever Safety-valve.....inches	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4	5
Size of Blow-off Cock.....inches	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2	2
Size of Feed and Check Valves.....inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$
Diameter of Stack (No. 16 Steel).....inches	16	16	18	18	20	20	24	24	26	26	28	28
Length of Stack.....feet	20	25	25	30	25	30	30	35	35	40	40	45
Weight of Boiler mounted, with Fixtures.....pounds	3900	4200	5250	5850	6250	7200	9850	11200	12650	13900	15000	16900
Stack and Guy-wire.....pounds	300	400	400	500	450	550	650	700	800	900	1000	1100
Complete Outfit.....pounds	4200	4600	5650	6350	6700	7750	10500	11900	13450	14800	16000	18000

A regular "complete outfit" consists of boiler, mounted on skids, with fixed dome, cast-iron smoke-box head with flue doors, common grates with rests, fire-door, stack of No. 16 steel with galvanized guy-wire six times length of stack, lever safety-valve, water-gauge, three gauge-cocks, steam-gauge with syphon and cock, feed-valve, check-valve, and blow-off cock. Tools are extra. Sheffield or Tupper grates can be substituted for common grates without change in price. With open-bottom boilers, Century rocking grates can be furnished at an extra price.

PORTABLE RETURN TUBULAR BOILER

FOR 100 LBS. WORKING PRESSURE



These boilers are regularly made with water front and open bottom; the furnace is entirely surrounded by water space which is the most effective heating surface. Reference to the specifications will further show that the proportions of grate and heating surface are designed as well as arranged to secure the highest efficiency and economy. All boilers are subjected to a hydrostatic test of 150 pounds. When so ordered we can make this type of boiler with water bottom. All sizes have a manhole in the top of shell and are regularly made with detachable dome, but we can furnish them without dome.

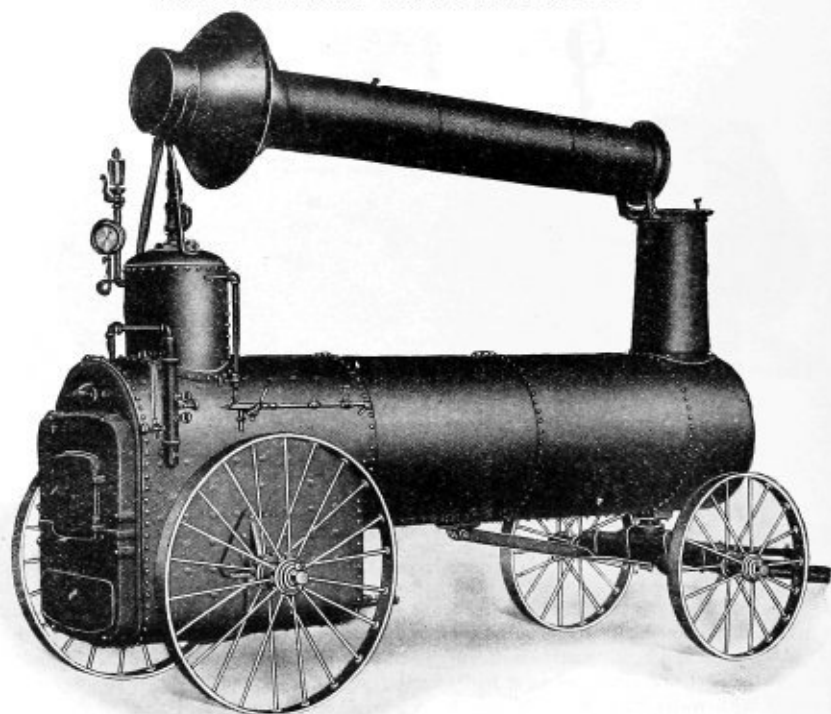
SPECIFICATIONS

Horsepower.....	25	30	35	40	50	60	70
Catalogue Number.....	200	201	202	203	204	205	206
Diameter of Shell.....inches	36	36	42	42	48	48	54
Width of Fire-box.....inches	30	30	36	36	42	42	48
Length of Fire-box.....inches	50	50	50	50	56	56	62
Number and length of 3-inch Tubes.....	22-107 inches	22-125 inches	28-119 inches	28-131 inches	44-119 inches	44-137 inches	51-137 inches
Number and length of 4-inch Tubes.....	12-54 inches	12-72 inches	16-66 inches	16-78 inches	22-60 inches	22-78 inches	28-72 inches
Diameter and height of Dome.....inches	20x20	20x20	20x24	20x24	24x24	24x24	27x30
Thickness of Shell.....inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Thickness of Heads.....inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Thickness of Fire-box.....inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Size of Lever Safety-valve or Steam Supply, inches	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Size of Blow-off Cock.....inches	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2
Size of Feed and Check Valves.....inches	$\frac{3}{4}$	1	1	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$
Diameter of Stack (No. 16 Steel).....inches	18	18	20	20	24	24	26
Length of Stack.....feet	30	35	35	40	35	40	40
Length of Boiler over all.....inches	134	152	149	161	149	167	169
Height from bottom of Skids to top of Dome, inches	81	81	91	91	97	97	100
Square feet of Heating Surface.....	258	303	374	416	532	617	720
Weight of Boiler mounted, with Fixtures.....pounds	5950	6350	7550	7950	10350	11650	13250
Stack and Guy-wire.....pounds	450	550	600	650	700	800	850
Complete Outfit.....pounds	6400	6900	8150	8600	11050	11850	14100

When a "complete outfit" is ordered we furnish the boiler mounted on skids with dome, fire-door, steel smoke-box, with hinge flue door and stack-neck, common stationary grates and rests, cast-iron rear head with flue-doors, flame-plate, stack of No. 16 steel with galvanized guy-wire six times length of stack, lever safety-valve, water-column with water-gauge and three gauge-cocks, steam-gauge with syphon and cock, feed and check valves and blow-off cock. Sheffield or Tupper grates can be furnished instead of common grates. With open-bottom boilers, Century rocking grates can be furnished at an extra price.

PORTABLE STEEL BOILERS COMPLETE MOUNTED ON WHEELS

With Cast Front and Water Bottom Fire Boxes



Fixtures comprise hinged smoke stack, grates, pop safety valve, steam gauge, water gauge with water column, gauge cocks, whistle, blow-off, check and stop valves, injector attached, running gear as shown in cut, including wheels, tongue, neckyoke, doubletree, whiffletrees, and tool box, but do not include driver's seat, brake, or hand suction pump, which will be furnished, when so ordered, at an additional price.

All wheels are of iron, and of ample strength for the load to be carried.

Specifications

Number of Size	Horse-Power	Diam. of Boiler in Inches	Length of Fire Box in Inches	Width of Fire Box in Inches	Height of Fire Box in Inches	Number of 3-inch Tubes	Length of Tubes in Inches	Estimated Weight in Lbs.
0	6	26	34	21	29	17	54	3,300
1	8	28	36	22	32	18	60	3,500
3	10	30	38	24	34	22	72	3,900
4	12	32	38	26	38	26	72	4,500
5	15	32	44	26	38	26	78	4,900
6	20	34	52	28	38	30	90	5,700
7	25	36	52	30	40	34	96	6,800
8	30	36	52	30	40	34	102	7,000
9	35	40	52	34	44	40	102	7,900
10	40	40	60	34	44	42	120	8,900
10½	50	40	60	34	44	42	144	9,700
11	50	44	64	38	50	48	132	10,700
11½	60	44	64	38	50	48	144	11,200
12	60	48	64	42	52	52	144	12,200
13	70	48	64	42	52	52	168	13,000

FULL LENGTH TUBE VERTICAL TUBULAR BOILERS



Regular or Octagon Base
Carried in Stock

These boilers are made of open hearth flange steel plate, having a tensile strain of 60,000 pounds per square inch of section.

All sizes above 20 inches are well braced by means of stay bolts, and all boilers 30 inches and upward in diameter have their vertical seams double riveted: From No. 1 to No. 10 inclusive, the shells are made of a single sheet.

Boilers 20 to 30 inches in diameter have two, and the larger sizes three hand holes around the water leg, and the same number above the crown sheet. In boilers 20 inches in diameter the water space around the fire-box is $1\frac{1}{2}$ inches wide, in the 24-inch diameter 2 inches, and in all other sizes $2\frac{1}{2}$ inches wide.

The fixtures comprise: base, grate, hood, steam gauge, glass water gauge, gauge cocks, either pop or lever safety valve, blow-off valve, check and stop valve.

The Round Base is furnished with a wrought-iron bottom, securely fastened, and has an air space of one inch between the bottom of the base and the floor. By this means the use of brick may be avoided, when using the boiler on a wooden floor, with perfect safety.



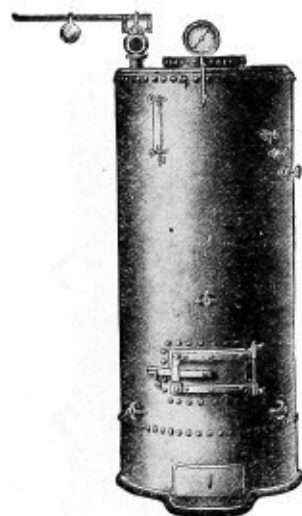
Round Base
Not Carried in Stock

No. of Size	Horse Power as Usually Rated	Diameter of Boiler, Inches	Height of Boiler, Feet	Diameter of Furnace, Inches	Height of Furnace, Inches	Thickness of Shell, Inches	Thickness of Heads, Inches	No. of Tubes, All 2 Inches in Diameter	Length of Tubes, Inches	Square Feet of Heating Surface	Diameter of Stack Required, Inches	Weight of Bare Boiler, Lbs.	Weight of Boiler Complete With Fixtures, Lbs.	Price of Bare Boiler Without Base, Grates, or Hood	Price of Boiler Complete	Add Net Extra for Round Base
O	1	20	3	16	18	$\frac{1}{2}$	$\frac{5}{16}$	16	18	18	8	350	450	\$43.00	\$ 60.00	.....
A	2	20	$3\frac{1}{4}$	16	18	$\frac{1}{2}$	$\frac{5}{16}$	19	24	25	8	450	550	50.00	67.00	.....
B	3	20	4	16	18	$\frac{1}{2}$	$\frac{5}{16}$	19	30	30	8	550	650	56.00	73.00	.....
1	4	24	4	19	23	$\frac{3}{8}$	$\frac{3}{8}$	24	25	39	8	900	1,300	85.00	108.00	\$ 4.50
2	5	24	5	19	23	$\frac{3}{8}$	$\frac{3}{8}$	24	37	51	8	1,000	1,400	97.00	120.00	4.50
3	6	24	6	19	23	$\frac{3}{8}$	$\frac{3}{8}$	24	49	63	8	1,100	1,500	109.00	132.00	4.50
3	6	24	6	19	23	$\frac{3}{8}$	$\frac{3}{8}$	30	34	71	10	1,100	1,500	114.00	141.00	5.00
4	7	27	5	21	26	$\frac{3}{8}$	$\frac{3}{8}$	42	34	75	10	1,200	1,800	141.00	175.00	5.50
4	7	30	5	24	26	$\frac{3}{8}$	$\frac{3}{8}$	42	46	96	10	1,400	2,000	161.00	195.00	5.50
5	9	30	6	24	26	$\frac{3}{8}$	$\frac{3}{8}$	42	58	107	10	1,600	2,200	181.00	215.00	5.50
6	11	30	7	24	26	$\frac{3}{8}$	$\frac{3}{8}$	60	46	134	14	1,700	2,300	202.00	250.00	6.00
7	12	36	6	30	26	$\frac{3}{8}$	$\frac{3}{8}$	60	58	164	14	2,100	2,700	227.00	275.00	6.00
8	14	36	7	30	26	$\frac{3}{8}$	$\frac{3}{8}$	60	70	194	14	2,500	3,100	252.00	300.00	6.00
9	16	36	8	30	26	$\frac{3}{8}$	$\frac{3}{8}$	84	54	219	16	2,800	3,700	297.00	360.00	13.00
10	20	42	7	36	30	$\frac{3}{8}$	$\frac{3}{8}$	84	54	261	16	3,200	4,100	337.00	400.00	13.00
11	23	42	8	36	30	$\frac{3}{8}$	$\frac{3}{8}$	84	78	303	16	3,600	4,500	377.00	440.00	13.00
12	27	42	9	36	30	$\frac{3}{8}$	$\frac{3}{8}$	120	66	363	20	4,000	5,400	456.00	535.00	18.00
13	30	48	8	42	30	$\frac{3}{8}$	$\frac{3}{8}$	120	78	423	20	4,500	5,900	506.00	585.00	18.00
14	35	48	9	42	30	$\frac{3}{8}$	$\frac{3}{8}$	120	90	483	20	5,000	6,400	556.00	635.00	18.00
15	40	48	10	42	30	$\frac{3}{8}$	$\frac{3}{8}$	150	90	600	20	5,600	7,000	631.00	710.00	18.00
16	50	48	10	42	30	$\frac{3}{8}$	$\frac{3}{8}$	180	90	713	24	6,500	8,000	772.00	885.00	.....
16	60	54	10	48	30	$\frac{3}{8}$	$\frac{3}{8}$	180	90	713	24	6,500	8,000	772.00	885.00	.....
17	75	64	12	48	30	$\frac{3}{8}$	$\frac{3}{8}$	180	114	893	24	7,600	9,100	912.00	1,025.00	.....

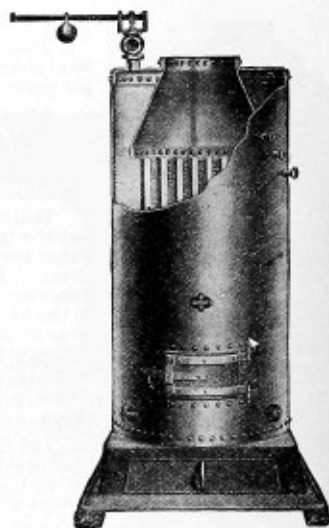
Prices do not include Stack or Injector, which are always classed as extras

VERTICAL TUBULAR BOILERS

Submerged Tubes



Regularly constructed for 100 pounds working pressure, but on special order can be promptly furnished for 125 pounds working pressure. All sizes have shell extended to form ash-pit and are furnished with cast-iron bottom plate.



SPECIFICATIONS

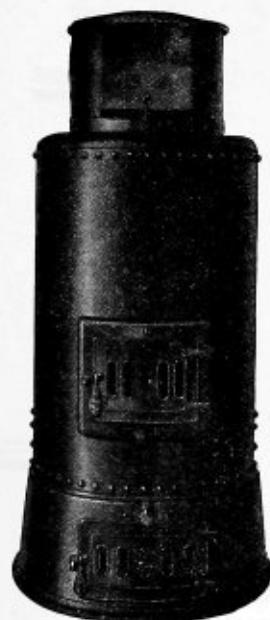
Horsepower	5	6	8	10	12	15	18	20	25	30	35	40	45
Catalogue Number	515	516	517	518	519	520	521	522	523	524	525	526	527
Diameter of Shell.....inches	24	24	30	30	30	36	36	42	42	48	48	48	48
Height of Boiler.....inches	60	72	72	78	84	84	90	87	93	102	108	114	120
Height over all.....inches	68	80	80	86	92	92	98	95	101	110	116	122	128
Thickness of Shell.....inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
Thickness of Heads.....inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$
Thickness of Fire-box.....inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
Diameter of Fire-box.....inches	19 $\frac{1}{2}$	19 $\frac{1}{2}$	25 $\frac{1}{2}$	25 $\frac{1}{2}$	25 $\frac{1}{2}$	31 $\frac{3}{8}$	31 $\frac{3}{8}$	37 $\frac{3}{8}$	37 $\frac{3}{8}$	42 $\frac{3}{8}$	42 $\frac{3}{8}$	42 $\frac{3}{8}$	42 $\frac{3}{8}$
Height of Fire-box.....inches	24	24	27	27	27	27	27	27	27	30	30	30	30
Number of 2-inch Tubes.....	28	31	48	48	48	68	68	92	92	128	128	128	128
Length of Tubes.....inches	18	30	27	33	39	39	45	36	42	45	51	57	63
Size Lever Safety-valve.....inches	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2 $\frac{1}{2}$	3	3
Size Blow-off Cock.....inches	1	1	1	1	1	1	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$
Size Feed and Check Valves.....inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Diameter Stack (No. 16 Steel) inches	12	12	14	14	14	16	16	18	18	24	24	24	24
Weight of Boiler only.....pounds	1150	1300	1750	1850	1950	2500	2600	3100	3250	4400	4600	4800	5000
Fixtures and Trimmings.....pounds	200	200	250	250	250	300	300	550	550	650	650	650	650
Complete Outfit.....pounds	1350	1500	2000	2100	2200	2800	2900	3650	3800	5050	5250	5450	5650

A regular "complete outfit" consists of boiler with bottom plate, fire door, grates with rest, water gauge, three gauge cocks, steam gauge with syphon and cock, lever safety valve, feed valve, check valve, and blow-off cock. Stack, tools and injector or inspirator with fittings and valves are extra.

TABASCO WATER HEATERS

ALL STEEL — SELF-FEED AND SURFACE BURNERS

FOR USE WHEREVER HOT WATER SUPPLY IS NEEDED



Magazine Feed or Surface Burner

Heater	Heating Capacity, Gallons per Hour	Size of Heater, Inches	Total Height, Inches	Sizes, Flows and Returns	Weight, Pounds	Price, Each	
						Price Magazine Feed	Price Surface Burner
17	130	17 x 30	52	2-1½	400	\$ 78.00	\$ 64.00
18	150	17 x 36	57	2-1½	420	82.00	68.00
21	200	21 x 30	52	2-2	520	93.00	77.00
22	250	21 x 36	59	2-2	550	100.00	84.00
23	300	21 x 42	65	2-2	580	107.00	90.00
24	350	21 x 48	71	2-2	610	113.00	95.00
25	300	25 x 36	59	2-2	780	143.00	120.00
26	350	25 x 42	65	2-2	810	150.00	126.00
27	400	25 x 48	71	2-2	840	158.00	133.00
30	500	30 x 42	65	2-3	1,100	171.00	140.00
31	600	30 x 48	75	2-3	1,150	180.00	150.00
32	700	30 x 54	81	2-3	1,240	188.00	160.00

Magazine Feed Heaters are always shipped unless Surface Burners are specified in order

TABASCO JUNIOR WATER HEATERS

SURFACE BURNERS ONLY



No.	Size of Heater, Inches	Gallons per Hour	Size, Flows and Returns, Inches	Weight, Pounds	Price, Each
1	10 x 16	30	1	125	\$38.00
2	10 x 18	40	1	130	40.00
3	12 x 24	65	1	200	48.00
4	12 x 30	80	1	215	50.00
5	15 x 30	100	1¼	280	56.00
6	15 x 36	120	1¼	300	60.00

All Junior Heaters, except Nos. 1 and 2, have Front Fire Doors

WILKES' WATER HEATERS

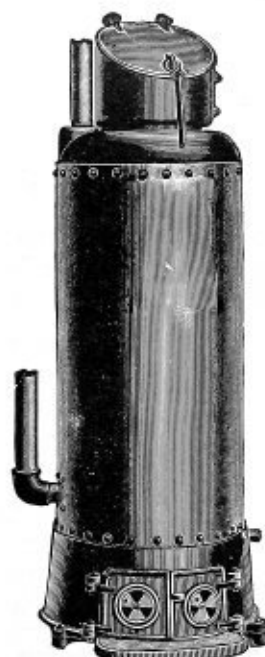
Specially Adapted for Heating Water for
 Dwellings Laundries
 Barber Shops Conservatories
 Baptisteries Poultry Houses
 Carving Tables Etc.

Perfectly Safe, Easily Managed, Economical in Fuel

Can be Set up as Easily and Quickly as an Ordinary Stove.
 Every Heater is TESTED to 100 Pounds Cold Water Pressure.

Can be Used with Either Hard or Soft Coal

The Motion of the Water Being Entirely Vertical Insures an Active and Steady Circulation



Cut Shows Not Self-Feeder



Cut Shows Self-Feeder

SMALL SIZES NOT SELF-FEEDERS WITH FEED BOX WITH OR WITHOUT FIRE DOOR

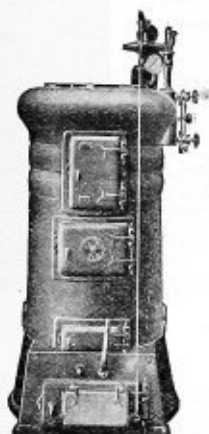
Fire Door in Shell Extra

Size of Boiler, inches	Heating Capacity, Gals. per Hour.	Size of Openings, inches	Heating Surface, Sq. inches	Approximate Heating Power 2-inch Pipe, feet	Height from Floor to Top, inches	Approximate Weight, pounds	Price, without Fire Door
For Carving Tables, etc. 10x18	40	3/4	399	60	25 1/2	75	\$21.00
For Private Residences, etc. 12x24	65	1	648	100	32 1/2	120	25.00
Small Conservatories, 12x30	75	1	792	125	38 1/2	130	26.50
Laundries, etc. 14x30	100	1 1/4	945	150	40 1/2	180	30.00
	125	1 1/2	1,066	175	46 1/2	190	32.00

SELF-FEEDERS WITH COAL MAGAZINE

Size of Boiler, inches	Heating Capacity, gallons per hour	Size of Openings, inches	Approximate Heating Power, 4-in. Pipe, feet	Extreme Height Heater, inches	Approximate Weight, pounds	Price, with Coal Magazine
16 x 30	140	1 1/2	250	57	340	\$ 57.50
16 x 36	150	1 1/2	300	63	380	60.00
20 x 30	200	2	425	60	445	72.00
20 x 36	250	2	450	64	500	75.00
20 x 42	275	2	500	70	530	80.00
24 x 36	325	2	700	66	700	105.00
24 x 42	350	2	900	72	740	110.00
30 x 42	600	3	1,200	75	1,230	130.00
30 x 48	700	3	1,250	81	1,280	135.00
36 x 42	900	3	1,450	75	1,950	185.00
36 x 48	1,000	3	1,550	81	2,000	195.00
42 x 42	1,200	3	2,000	76	2,600	215.00
42 x 48	1,300	3	2,400	82	2,700	225.00

HEATING BOILERS FOR STEAM AND HOT WATER

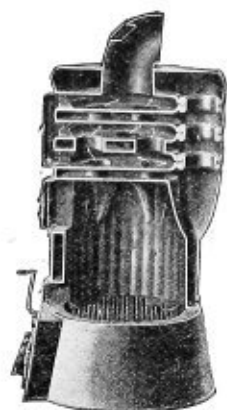


STEAM BOILERS

Size	Diam. Crate Ring, Inches	HEIGHTS, INCHES		Diam. Smoke Pipe	Number and Size Outlets and Inlets	Rating, Sq. Ft. Rad.	Price Each
		To Outlets	To Water Line				
16-0	16	48	44	6	2-2 in.	250	\$152.00
16-1	16	52½	48½	6	2-2 in.	300	158.00
16-2	16	57	53	6	2-2 in.	350	176.50
19-0	19	49	45	7	2-2½ in.	380	192.00
19-1	19	53½	49½	7	2-2½ in.	400	204.00
19-2	19	58	54	7	2-2½ in.	450	218.00
22-0	22	50	46	8	2-3 in.	500	233.00
22-1	22	54½	50½	8	2-3 in.	550	245.50
22-2	22	59	55	8	2-3 in.	600	259.50
25-0	25	51	47	9	2-3 in.	675	290.00
25-1	25	55½	51½	9	2-3 in.	700	316.50
25-2	25	60	56	9	2-3 in.	800	349.50
29-0	29	56	48	10	2-4 in.	950	380.00
29-1	29	60	51½	10	2-4 in.	1000	411.00
29-2	29	64	56	10	2-4 in.	1100	442.50
29-3	29	68	60½	10	2-4 in.	1200	473.00

Boiler trimmings extend 16 inches above outlet.

IF SOFT COAL is to be used, figure one size larger Boiler.



HOT WATER BOILERS

Size	Height to Outlets	Diam. of Smoke Pipe	Number and Size Outlets and Inlets	Rating, Sq. Ft. Rad.	Price Each
0-16	44	6	2-2 in.	425	\$142.00
1-16	48½	6	2-2 in.	500	144.00
2-16	53	6	2-2 in.	575	167.00
0-19	45	7	2-2½ in.	625	182.00
1-19	49½	7	2-2½ in.	650	194.00
2-19	54	7	2-2½ in.	750	208.00
0-22	46	8	2-3 in.	850	223.00
1-22	50½	8	2-3 in.	900	236.50
2-22	55	8	2-3 in.	1000	250.00
0-25	47	9	2-3 in.	1100	280.00
1-25	51½	9	2-3 in.	1150	308.00
2-25	56	9	2-3 in.	1325	338.50
0-29	50½	10	2-4 in.	1500	370.00
1-29	55	10	2-4 in.	1650	401.00
2-29	59½	10	2-4 in.	1825	432.00
3-29	64	10	2-4 in.	2000	464.00

IF SOFT COAL is to be used, figure one size larger Boiler.

RATINGS

The ratings for these boilers provide that all piping (mains and risers, flow and return) shall be figured as radiating surface, in addition to the cast iron direct radiation to be used.

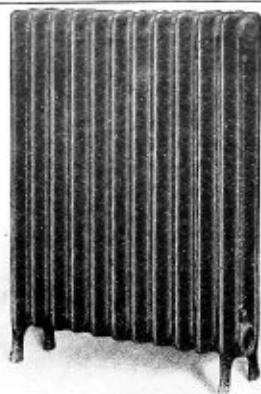
The ratings for steam are based on a standard of two pounds pressure at the boiler, and for water on a standard of water at 180 degrees temperature as it leaves the boiler.

For Steam—When a pipe, coil or cast iron section is introduced into the fire pot, a steam coil placed in a tank for the purpose of heating water for domestic use, additional capacity should be provided for, in estimating size of boiler required, at rate of 1½ square feet of direct radiation for each gallon of water to be thus heated per hour.

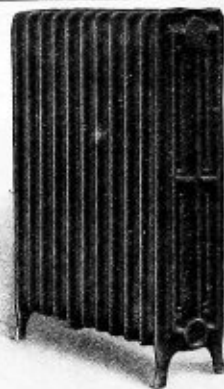
For Water—When a p.p.e. coil or cast iron section is introduced into the fire pot for the purpose of heating water for domestic use, additional capacity should be provided for, in determining the size of the boiler required, at the rate of two square feet of direct radiation for each gallon of water to be thus heated per hour.

When indirect radiation is to be used, not less than 75 per cent. increase over direct radiation should be figured in determining the size of the boiler required.

Guarantee—These boilers are guaranteed only to the extent of furnishing new castings for any found defective in manufacture. They are conservatively rated according to accepted standards, but on account of the varying conditions surrounding their installation, we do not guarantee our boilers except as above.



**SUN, PLAIN STEAM
OR HOT WATER
RADIATORS**

**Two Column Radiator**

Section	Length 2 1/2 Inches per Section	45 Inches High 5 Feet per Section	38 Inches High 4 Feet per Section	32 Inches High 3 1/2 Feet per Section	26 Inches High 3 Feet per Section	23 Inches High 2 1/2 Feet per Section	20 Inches High 2 Feet per Section
2	5	10	8	6 3/4	5 1/2	4 3/4	4
3	7 1/2	15	12	10	8	7	6
4	10	20	16	13 1/4	10 3/4	9 1/2	8
5	12 1/2	25	20	16 3/4	13 3/4	11 3/4	10
6	15	30	24	20	16	14	12
7	17 1/2	35	28	23 1/4	18 3/4	16 1/4	14
8	20	40	32	26 3/4	21 3/4	18 3/4	16
9	22 1/2	45	36	30	24	21	18
10	25	50	40	33 1/4	26 3/4	23 1/4	20
11	27 1/2	55	44	36 3/4	29 3/4	25 3/4	22
12	30	60	48	40	32	28	24
13	32 1/2	65	52	43 1/4	34 3/4	30 3/4	26
14	35	70	56	46 3/4	37 3/4	32 3/4	28
15	37 1/2	75	60	50	40	35	30
16	40	80	64	53 1/4	42 3/4	37 3/4	32
17	42 1/2	85	68	56 3/4	45 3/4	39 3/4	34
18	45	90	72	60	48	42	36
19	47 1/2	95	76	63 1/4	50 3/4	44 3/4	38
20	50	100	80	66 3/4	53 3/4	46 3/4	40
21	52 1/2	105	84	70	56	49	42
22	55	110	88	73 1/4	58 3/4	51 3/4	44
23	57 1/2	115	92	76 3/4	61 3/4	53 3/4	46
24	60	120	96	80	64	56	48
25	62 1/2	125	100	83 1/4	66 3/4	58 3/4	50
26	65	130	104	86 3/4	69 3/4	60 3/4	52
27	67 1/2	135	108	90	72	63	54
28	70	140	112	93 1/4	74 3/4	65 3/4	56
29	72 1/2	145	116	96 3/4	77 3/4	67 3/4	58
30	75	150	120	100	80	70	60
31	77 1/2	155	124	103 1/4	82 3/4	72 3/4	62
32	80	160	128	106 3/4	85 3/4	74 3/4	64
List Price per Square Foot	\$0.41	\$0.42	\$0.46	\$0.50	\$0.53	\$0.57	

Width of Radiator over all, 8 inches.

Width of Radiator over all, 10 1/4 inches.

Distance from floor to center of tapping for water or feed end of two pipe steam, 5 inches. From floor to bottom of opening for one pipe steam or return end of two pipe steam, 4 inches.

REGULAR TAPPINGS—Unless otherwise specified all Radiators will be tapped solid as follows:

One-Pipe Steam

Radiators containing 24 square feet and under,.....	1 inch
Above 24, but not exceeding 60 feet,.....	1 1/4 inch
Above 60, but not exceeding 100 feet,.....	1 1/2 inch
Above 100 square feet,.....	2 inch

Two-Pipe Steam

Radiators containing 48 square feet and under,.....	1 x 3/4 inch
Above 48, but not exceeding 96 feet,.....	1 1/4 x 1 inch
Above 96 square feet,.....	1 1/2 x 1 1/4 inch

Hot Water

Radiators containing 40 square feet and under,.....	1 x 1 inch
Above 40, but not exceeding 72 feet,.....	1 1/4 x 1 1/4 inch
Above 72 square feet,.....	1 1/2 x 1 1/2 inch

Furnished in Plain or Ornamental, all Heights, 1, 2, 3 and 4 Columns

SUGAR OR WASH KETTLES

With Bails. Milled and Painted



No.	Dimensions, inches	CAPACITY, GALLONS		Price Each
		Actual	Usually Rated	
1	16 x 11	8	10	\$2.20
2	18 x 12	10½	13	2.80
3	20½ x 13½	15	18	3.50
4	22 x 13½	18½	20	4.50
5	23 x 14½	21½	25	5.00
6	25 x 15½	25½	30	6.00
7	26 x 16	29½	32	7.00

CALDRON KETTLES

For Melting Metals, etc.



Actual Measure, Gallons.	Diam. Out- side of Flange, in.	Diam. In- side of Flange, in.	Depth Inside, in.	Price Each
25	28	24	16	\$ 6.00
33	31	28	16	8.00
41	34	30	19	10.00
48	35	31	19	12.00
53	36	32	20	13.00
65	39	34	20½	14.00
75	41	36	22	18.00
90	43	38	22	25.00
110	46	42	23	30.00
170	61	54	24	50.00
230	62½	58	31	70.00
500	80	72	40	150.00

All sizes above 75 gallons are cast without lugs on rim unless specially ordered.

Any of the above Kettles may be had tapped for outlet pipes at an extra charge of \$3.00 net.

All sizes of the above Caldrons, up to 90 gallons, may be had coated with gray enamel at an extra charge of from \$10.00 to \$12.00 net.

FARM BOILERS
or Dumping Caldrons
Burns Coal or Wood

It is very economical with fuel. The kettle when dumped exposes all the flues, so it can be kept free from soot—a feature no other boiler has. It is used largely by

Brewers Packers
Bottlers Varnish Makers
Public Institutions Distillers
and many other trades that require a caldron to heat or boil any substance.

No.	Cap. Gals.	For Wood	For Coal	For Wood and Coal	Add for Enameling
1	25	\$23.00	\$23.00	\$27.00	\$10.00
2	48	34.00	34.00	38.00	12.50
3	53	38.00	38.00	42.00	15.00
4	75	46.00	46.00	50.00	17.50

STEEL BOILERS

The jacket or shell is made from heavy sheet steel, with edges banded, and has no bottom, as the stove is intended to be used on the earth, or to be filled with brick or clay up to the bottom of the feed door. It is provided with double doors so that it can be conveniently used as a coal burner when supplied with coal fixtures.

No.	Capacity, Gallons	Price Each	No.	Capacity, Gallons	Price Each
1	25	\$12.00	6	58	\$19.50
2	33	14.00	7	65	22.00
3	40	15.00	8	75	26.00
4	48	16.50	9	90	32.00
5	53	18.00	10	110	36.00

STEAM JACKET KETTLES

These Kettles are made of very thick metal, put together without stay bolts, have ample steam space, are packed with asbestos sheet packing, tapped for inlet and drip pipes, and unless ordered for higher pressure are tested to 75 lbs hydraulic pressure to the square inch.

The inner and outer sections are cast separately, so that the inner Kettle may be replaced when worn out from use of acids or any corrosive material.

Either style may be had with any size outlet pipe, or any special attachment may be made to order.



Capacity, gallons	Inside Dimensions, inches	Price Each
5	14 x 10	\$ 20.00
10	18 x 12	28.00
15	21 x 14	32.00
20	22 x 15	40.00
30	28 x 16	60.00
40	29 x 17	65.00
90	38 x 22	110.00

Hinged covers, \$8.00 to \$10.00 extra, net.

These capacities vary somewhat, as the extra thickness of metal used for the heavier steam pressures decreases the capacity slightly.

The smaller sizes of either style can be furnished coated with gray enamel, at an extra cost of from \$30.00 to \$35.00 net.



With Raised Curb

Capacity, gallons	Inside Dimensions, inches	Price Each
34	24 x 21	\$ 60.00
54	29 x 22	75.00
114	38 x 27	125.00

LEAD MELTING FURNACES

Capacity of Kettle, 750 Pounds Lead

These furnaces are constructed of $\frac{3}{8}$ inch boiler steel, strongly riveted and braced, with cast iron dumping and shaking grate.



No. 1

Has a heavy cast iron fire pot setting inside the shell, which protects it from the heat of the fire. The wheels are made of steel of ample strength, and revolve on steel axles. The handle is provided with a folding rest that locks in position so that the furnace always stands solid on three points. The kettle is very heavy, and has an inside flange to prevent the molten lead slopping when the furnace is being moved. A heavy steel cover is supplied without extra charge.

Price.....\$50.00



No. 2

The furnace rests on three heavy steel legs, and has four carrying loops riveted to shell so that it can be easily carried about by means of two pieces of pipe or iron bars. It can be furnished with or without cast iron fire pot inside of shell.

With cast iron fire pot.....\$35.00

Without fire pot.....32.00

A heavy steel cover for kettle is supplied without extra charge.

LITTLE GIANT STEAM FEED COOKER



The trimmings include base, grate, hood, steam gauge, glass water gauge, two gauge cocks, blow-off valve, pump or injector fitted for supplying boiler with water, safety valve, 2½ ft. of suction hose, 3 ft. of steam pipe with valve to convey steam to barrel or vat for cooking feed or boiling water.

Tested to 100 lbs. pressure before shipping.

Diameter of Boiler, Inches...	20
Height of boiler, inches.....	44
Number of 2-inch tubes.....	13
Length of tubes, inches.....	30
Thickness of shell, inches.....	$\frac{3}{16}$
Thickness of heads, inches.....	$\frac{5}{16}$
Height over all, inches.....	58
Weight complete, pounds.....	400
Price of Bare Cooker with Fire-box liner.....	\$40.00
Price of safety valve.....	1.30
Price of water gauge.....	1.50
Price of gauge cocks.....	1.20
Price of steam gauge.....	2.68
Price of blow-off cock.....	1.08
Price of either hand-pump or injector.....	4.60
Price of outlet valve and pipe.....	1.00
Price of grate.....	1.50
Price of hood.....	1.34
Price of base.....	3.80
Price of complete cooker.....	\$60.00

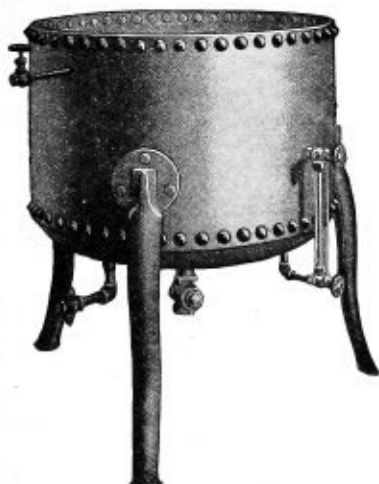
STEAM JACKETED LARD KETTLES

Tested Under 120 Pounds Pressure



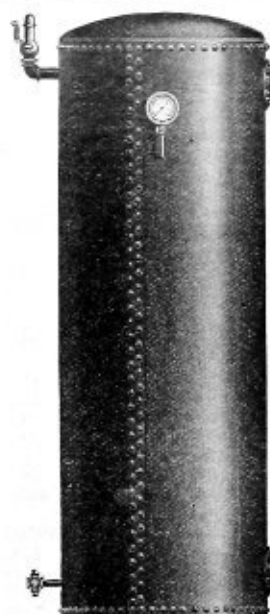
Fittings comprise air valve, drip valve, water gauge and stop cock for tapping the lard or other material.

Capacity in Gallons....	25	50	75	100	150	200
Diameter inside, in....	22	28	28	34	38	44
Diameter outside, in....	26	33	33	39	43	49
Depth inside, in....	18	20	29	27	32	32
Height from floor to top of kettle, in....	18	20	21	21	22	22
Height from floor to top of kettle, in....	39	42	52	51	57	57
Thickness of shell, in....	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$
Thickness of heads, in....	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
Approximate shipping weight, lbs.....	360	465	570	655	875	1,250
Price complete, as shown	\$50.00	\$60.00	\$70.00	\$80.00	\$120.00	\$160.00



AIR RECEIVERS

Steel of 60,000 pounds tensile strength is used in the shells and heads of our air receivers. Shell seams are lap joint, double riveted; circular seams single riveted; and heads are dished to a radius equal to the diameter of the shell, making an exceptionally strong receiver which we test to 175 pounds hydrostatic pressure. This insures them being safe and tight under 115 pounds working pressure. Receivers larger in diameter than 36 inches are regularly made with a manhole. Horizontal Receivers furnished if desired.

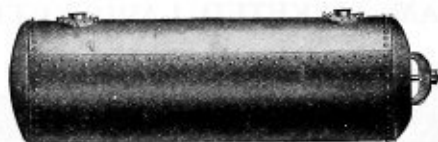


No.	Diam., Inches	Length, Feet	Thick. Shell, inches	Thick. Head, inches	Inlet and Outlet	Size, Safety Valve	Compressor, cap. in cu. ft. per min. adapted for	Weight, Lbs.	Price Each
1	20	5	1/4	5/16	2	3/4	50 or less	250	\$ 38.00
2	24	6	1/4	3/8	2 1/2	1	100 "	450	46.00
3	24	8	1/4	3/8	3	1 1/4	120 "	600	50.00
4	30	6	1/4	3/8	3	1 1/4	120 "	575	58.00
5	30	8	1/4	3/8	3	1 1/2	135 "	675	70.00
6	30	10	1/4	3/8	3	1 1/2	150 "	775	82.00
7	36	6	1/4	3/8	3	1 1/2	175 "	750	80.00
8	36	8	1/4	3/8	3 1/2	1 1/2	250 "	900	95.00
9	36	10	1/4	3/8	4	2	350 "	1150	115.00
10	36	12	1/4	3/8	4	2	400 "	1325	125.00
11	42	6	1/4	3/8	4	2	450 "	950	97.00
12	42	8	1/4	3/8	4	2	500 "	1350	115.00
13	42	10	1/4	3/8	5	2	600 "	1750	135.00
14	42	12	1/4	3/8	6	2 1/2	750 "	2000	145.00

Fixtures—Include Pop Safety Valve, Pressure Gauge and Piping, Drain Cock, and Inlet and Outlet Openings. Any size furnished promptly.

STEEL TANKS. (Tested to 150 Lbs.)

Eclipse Manhole in One Head



Size Tank	Thick-ness, Shell	Thick-ness, Heads	Weight, Lbs.	Capacity, Gallons	Price Each	Size Tank	Thick-ness, Shell	Thick-ness, Heads	Weight, Lbs.	Capacity, Gallons	Price Each
30 in. x 3 ft.	1/4 in.	3/8 in.	600	110	\$116.00	36 in. x 12 ft.	1/4 in.	3/8 in.	1,850	625	\$208.00
30 " x 4 "	1/4 "	3/8 "	700	145	120.00	42 " x 6 "	1/4 "	3/8 "	1,300	430	185.00
30 " x 5 "	1/4 "	3/8 "	800	180	124.00	42 " x 8 "	1/4 "	3/8 "	1,600	575	200.00
30 " x 6 "	1/4 "	3/8 "	890	220	128.00	42 " x 10 "	1/4 "	3/8 "	1,850	720	220.00
30 " x 7 "	1/4 "	3/8 "	1,000	250	140.00	42 " x 12 "	1/4 "	3/8 "	2,100	860	240.00
30 " x 8 "	1/4 "	3/8 "	1,100	290	148.00	42 " x 14 "	1/4 "	3/8 "	2,450	1,000	260.00
36 " x 4 "	1/4 "	3/8 "	900	210	146.00	48 " x 8 "	1/4 "	3/8 "	2,200	750	248.00
36 " x 5 "	1/4 "	3/8 "	1,000	260	154.00	48 " x 10 "	1/4 "	3/8 "	2,600	940	278.00
36 " x 6 "	1/4 "	3/8 "	1,140	315	162.00	48 " x 12 "	1/4 "	3/8 "	2,900	1,130	306.00
36 " x 7 "	1/4 "	3/8 "	1,250	365	172.00	48 " x 14 "	1/4 "	3/8 "	3,300	1,300	332.00
36 " x 8 "	1/4 "	3/8 "	1,400	420	180.00	48 " x 16 "	1/4 "	3/8 "	3,700	1,500	358.00
36 " x 10 "	1/4 "	3/8 "	1,600	520	190.00						

In writing, state size, shape, thickness, pressure, kind of material used for, and location of openings, and whether with or without manholes.

We furnish promptly tanks of any shape or dimensions for any purpose.

SMOKE BREECHING

**BREECHING No. 1, FOR TWO BOILERS**

Damper included for each boiler

Diameter of Boiler, Inches	Center to Center, Inches	Diameter of Stack, Inches	Height above Boilers, Inches	WEIGHTS, POUNDS			
				No. 14	No. 12	No. 10	No. 8
36	62	24	54	300	.....	.....	.....
42	68	26	60	450	650	.....	.....
48	78	36	66	600	800	1000	.....
54	84	40	66	650	850	1050	.....
60	90	42	68	.....	1000	1200	1450
66	96	46	72	.....	1050	1250	1500
72	106	48	78	.....	1200	1500	1800
78	112	52	84	.....	.....	1850	2200
84	118	56	90	.....	.....	2300	2750

**BREECHING No. 2, FOR TWO OR THREE BOILERS**

Extending 2 feet beyond boiler wall. Damper included for each boiler

Diameter of Boiler, Inches	Center to Cen- ter, Inches	DIAMETER BREECHING, INCHES		WEIGHTS, POUNDS									
				TWO BOILERS					THREE BOILERS				
		Two Boilers	Three Boilers	No. 16	No. 14	No. 12	No. 10	No. 8	No. 14	No. 12	No. 10	No. 8	
36	62	28	34	300	350	450	600	750	600	750	1000	1250	
42	68	32	40	400	450	600	750	900	750	1000	1250	1550	
48	78	36	42	450	550	700	850	1100	950	1200	1450	1850	
54	84	40	48	.....	650	900	1150	1400	1100	1500	1950	2400
60	90	44	52	.....	800	1100	1400	1700	1350	1850	2400	2900
66	96	50	60	.....	900	1250	1600	1900	1500	2100	2700	3200
72	106	52	64	.....	1350	1900	2400	2900	2300	3200	4000	4900
78	112	56	68	.....	.....	2400	3000	3700	.....	4000	5000	6200
84	118	60	72	.....	.....	2700	3400	4100	.....	4500	5700	6900

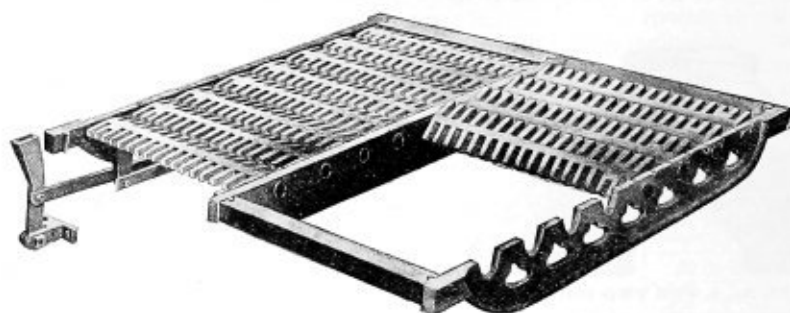
Unless otherwise specified, we furnish breechings made of No. 14 steel for boilers of 50 HP. or smaller; of No. 12 steel for boilers 60 to 115 HP.; and of No. 10 steel for 125 HP. and larger. When necessary, we can furnish special breechings according to drawings and specifications that may be submitted to us. When made up in a special way or when iron is required instead of steel there is an extra charge.

SMOKE-STACKS—Specifications and Weight per Foot.

Diameter, In. . . .	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	46	48	52	54	60
No. 16 Steel. . . .	10	12	14	15	17	19	20	22	24	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 14 Steel. . . .	13	15	17	19	21	23	25	27	29	32	34	36	39	40	42	44	48	51	54	58	62
No. 12 Steel. . . .	.....	.....	.....	.....	27	29	32	35	37	40	42	45	50	52	55	57	61	64	70	74	80
No. 10 Steel. . . .	.....	.....	.....	.....	32	36	39	42	45	48	52	55	60	64	66	70	74	78	84	90	96
No. 8 Steel. . . .	.....	.....	.....	.....	.....	.....	.....	.....	63	67	70	76	80	85	90	96	102	110	114	120	.....
Stack Plate. . . .	.....	.....	.....	.....	.....	160	170	200	260	350	350	400	400	400	500	500	700	700	700	1000	.....
Spark Arrestor. .	10	12	14	15	20	23	25	27	30	32	34	36	50	52	55	57	60	64	70	74	80

It is customary to furnish guy-wire six times the length of stack ordered. If more or less, or none is wanted, the order should be so written. Unless otherwise ordered, stacks are made in sections convenient for shipment.

CENTURY ROCKING GRATE



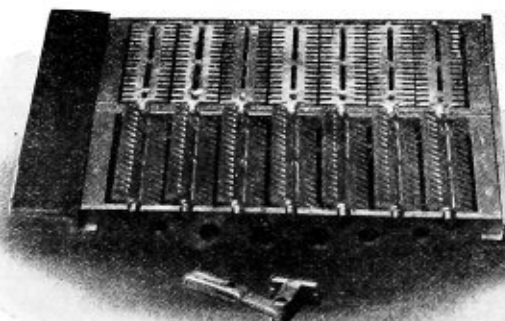
The rocking motion of the Century Grate is simple and positive. It is well adapted to breaking up caking coal fires without the aid of a slice-bar, and to freeing the grate from ashes and so affording unrestricted air openings, which means more complete combustion.

The grate is self-contained and can be attached to any style of setting by an operating engineer without changing the brick work of the furnace. The approximate weight, including rests and all attachments, is 65 pounds per square foot.

Furnished with $\frac{5}{8}$ -inch air space for run of mine coal and $\frac{3}{8}$ -inch air space for burning slack and screenings. State which is wanted, as the $\frac{5}{8}$ -inch is always sent unless otherwise ordered.

Price, per square foot \$4.50

"SIMPLEX" SHAKING AND DUMPING GRATES



These Grates are made with the proper air space, and made to go into any fire box without making changes. They can be put in by any mechanic. If you are using lump coal, you can use slack at a much less cost. If you are using slack, you can use a great deal less slack and get the same results.

Simplex Grate will pay for itself long before it is worn out, in reducing the time required for cleaning, for while this work is in progress, but little steam is formed, hence the pressure must fall, and it requires a very brisk fire to raise it again, which means rapid consumption of fuel. Any improvement which shortens the time referred to reduces the fall in pressure, hence saves coal.

Light pattern, complete, per square foot \$2.25

Heavy pattern, complete, per square foot 2.85

Please state number, size and style of boilers to be equipped, with exact size of furnace and size and depth of ash pit.

ORNAMENTAL BOILER FRONTS



Fitted with
Liner Plates,
Bearing Bars,
Soot Doors and
Frames, and
Skeleton Arch.

Size of Boiler, Inches	Height of Front, Feet and Inches	Width of Front, Feet and Inches	Fire Space, Inches	Ash Pit, Inches	Distance be- tween Boilers, Inches	Weight, Lbs.
36 single..	7 2	6 4	18	18	.....	2,000
36 double..	7 2	11 0	18	18	20	3,700
42 single..	7 10	7 2	18	18	.....	2,250
42 double..	7 10	12 4	18	18	20	4,350
48 single..	9 1	7 8	20	20	.....	3,125
48 double..	9 1	13 8	20	20	24	5,900
48 triple..	9 1	19 8	20	20	24	8,700
54 single..	9 6	8 0	24	20	.....	3,300
54 double..	9 6	14 6	24	20	24	6,400
54 triple..	9 6	21 0	24	20	24	9,400
60 single..	10 3	8 6	26	21	.....	3,900
60 double..	10 3	15 6	26	21	24	7,400
60 triple..	10 3	22 6	26	21	24	10,800
66 single..	11 6	9 2	28	22	.....	4,450
66 double..	11 6	16 10	28	22	26	8,400
66 triple..	11 6	24 6	28	22	26	12,300
72 single..	11 6	9 2	28	22	.....	4,500
72 double..	11 6	17 4	28	22	26	8,500
72 triple..	11 6	25 6	28	22	26	12,500

FULL FRONTS, NEW PATTERN

Fitted with Liner Plates, Bearing Bars, Soot
Doors and Frames, Skeleton Arch.

Size of Boiler, Inches	Height of Front, Feet and Inches	Width of Front, Feet and Inches	Fire Space, Inches	Ash Pit, Inches	Distance be- tween Boilers, Inches	Weight, Lbs.
48 single..	8 9	6 6	24	21	.....	2,600
48 double..	8 9	12 6	24	21	24	5,200
48 triple..	8 9	18 6	24	21	24	7,900
54 single..	8 9	6 6	24	21	.....	2,700
54 double..	8 9	13 0	24	21	24	5,400
54 triple..	8 9	19 6	24	21	24	8,100
60 single..	9 7	7 4	26	21	.....	3,100
60 double..	9 7	14 4	26	21	24	6,200
60 triple..	9 7	21 2	26	21	24	9,300
66 single..	10 4	8 4	28	22	.....	3,700
66 double..	10 4	15 10	28	22	26	7,400
66 triple..	10 4	23 8	28	22	26	11,100
72 single..	11 0	8 4	28	22	.....	3,750
72 double..	11 0	16 6	28	22	26	7,500
72 triple..	11 0	24 8	28	22	26	11,250

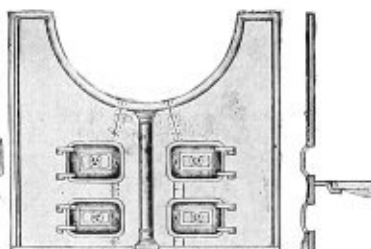
Prices on above, also plain fronts, on application.

HALF FRONTS

BOX LINERS



From 8 in. to
16 in. deep.



Size of Boiler, Inches	Height, Feet and Inches	Width, Feet and Inches	Fire Space, Inches	Ash Pit, Inches	Weight, Lbs.	Price
30	4 3	4 2	18	18	900	\$.....
36	4 4	4 4	19	19	900	.....
42	5 0	5 3	19	19	1,300	.....
48	5 9	5 8	24	22	1,500	.....
54	6 0	6 3	24	22	1,800	.....
60	6 4	6 9	24	22	2,000	.....
66	6 11	7 7	28	24	2,300	.....
72	7 1	8 1	28	24	2,400	.....

The weight given includes liners, bearing bars, 1
soot door and frame, and 1 back skeleton arch.



TOP LINER PLATES

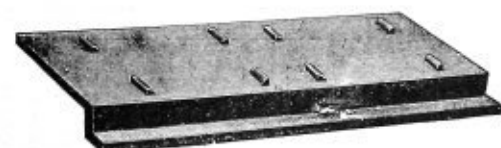
Size of front, inches.....	36	42	48	54	60	66
Weight of 1 top plate, lbs..	82	85	110	115	115	120



SIDE LINER PLATES

Size of front, inches....	36	42	48	54	60	66	72
1 side plate, lbs.....	46	46	85	85	85	85	85

FRONT ANGLE OR DEAD PLATE



Size of boiler, inches....	36	42	48	54	60	66	72
Length, inches.....	40	52	58	64	70	82	82
Weight, lbs.....	125	140	225	250	275	325	325

CENTER BEARING BARS



Size of Boiler, inches.	36	42	48	54	60	66	72
Length, inches.	42	48	54	60	66	72	78
Weight, lbs.	60	70	95	100	145	175	200

BACK ANGLE BARS



Size of Boiler, inches.	36	42	48	54	60	66	72
Length, inches.	46	52	58	64	70	82	82
Weight, lbs.	47	53	65	70	93	133	133

BACK SKELETON ARCH



Size of Boiler, Inches	Length, Inches	Radius, Inches	Weight, Lbs.
36	48	18	150
42	48	18	170
48	58	20	235
54	68	22	265
60	68	22	275
66	78	26	300
72	78	26	330

WALL BINDERS

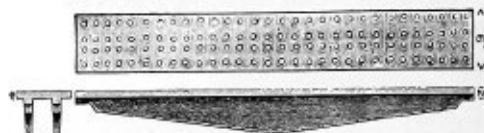


Wall Binders furnished any size or length desired. Please state distance from center to center of holes in ordering.



Size of Boiler, Inches	Weight of Side Binder, Lbs.	Distance Between Holes, Ft. Ins.	Weight of End Binder, Lbs.	Distance Between Holes, Ft. Ins.	Distance Between Holes, Ft. Ins.
36	60	4 8	60	2 5	2 11
42	75	6 0	75	2 6	2 9
48	100	7 0	90	3 4	3 8
54	109	8 0	104	3 4	4 2
60	110	8 4	105	3 7	4 6
66	198	9 3	160	4 0	4 6
72	198	9 3	160	4 0	4 6

SHAVING GRATE BARS



Length, inches.	30	36	42	48	54	60
Width, inches.	6	6	6	6	6	6
Weight, lbs.	32	45	59	72	82	94

COMMON GRATE BARS

Heavy Pattern



Length, Inches	Width, Inches	Weight, Lbs.	Air Space, Inches
42	3	50	5/8
48	3	61	5/8
50	3	62	5/8
54	3	68	5/8
60	3	83	5/8
66	3 1/2	104	5/8
72	3 1/2	114	5/8

Light Pattern



Length, Inches	Width, Inches	Weight, Lbs.	Air Space, Inches
24	2 1/4	20	1/2
26	2 1/4	22	1/2
27	2 1/4	23	1/2
28	2 1/4	24	1/2
30	2 1/4	26	1/2
33	2 1/4	34	1/2
36	3	36	1/2
42	3	40	1/2
48	3	48	1/2
54	3	54	1/2
60	3	68	1/2

OBTUSE GRATE BARS



Length, Inches	Width, Inches	Weight, Lbs.	Air Space, Inches	Metal, Inches
30	5	50	3/8	3/8
36	5	60	3/8	3/8
39	6	86	3/8	3/8

FINE SPACE COMMON GRATE BARS



Length, Inches	Width, Inches	Weight, Lbs.	Air Space, Inches
48	2 1/4	48	3/8
54	2 1/4	54	3/8
60	2 1/4	71	3/8
66	2 1/4	76	3/8

IMPROVED GRATE BAR



Length, Inches	Width, Inches	Metal, Inches	Air Space, Inches	Weight, Lbs.
33	6	1 1/2	1 1/2	65
36	6	1 1/2	1 1/2	73
42	6	1 1/2	1 1/2	86
48	6	1 1/2	1 1/2	100
54	6	1 1/2	1 1/2	115
60	6	1 1/2	1 1/2	130
66	6	1 1/2	1 1/2	142
72	6	1 1/2	1 1/2	160

MCGINNISS PATENT GRATE BAR



Length, Inches	Metal, Inches	Air Space, Inches	Weight, Lbs.	Width, Inches
30	1 1/2	1 1/2	13	1
36	1 1/2	1 1/2	18	1
42	3/8	3/8	18	3/4
48	3/8	3/8	20	3/4
48	3/8	3/8	21	1
48	1 1/2	3/4	26	1 1/4
52	1 1/2	3/8	25	1 1/8
54	1 1/2	3/8	24	7/8
54	1 1/2	1 1/2	25	1
54	1 1/2	5/8	26	1 1/8
56	1 1/2	5/8	27	1 1/8
57	3/4	3/8	43	1 1/8
60	3/8	5/8	38	1

ROUND GRATES FOR UPRIGHT BOILERS



In two parts.



In three parts.

Diam., In.	Lbs.	Diam., In.	Lbs.	Diam., In.	Lbs.
16	45	26	120	34	190
18	50	27	122	35	225
20	75	28	125	36	235
22	85	29	145	40	425
24	95	30	150	42	430
25	100	32	180	43	440

Large Sizes on Short Notice.

FOUNDATION WASHERS



3/4 in.	6x6 in.	7 lbs.
1 "	7x7 "	11 "
1 1/8 "	7x7 "	11 "
1 1/2 "	8x8 "	18 "
1 3/4 "	8x8 "	18 "

BASES FOR UPRIGHT BOILERS



Diameter, inches.	30	36	42	48	54
Weight, lbs.	218	220	270	420	460

MAN-HOLE COLLARS, PLATES AND CRABS

11 1/2 x 15 1/2



Size, Inches	1 Ring, Lbs.	1 Plate, Lbs.	2 Crabs, Lbs.	Lug., Lbs.
24	90	52	30	22
30	90	52	30	22
36	115	52	30	22
42	125	52	30	30
44	130	52	30	38
48	130	52	30	48
54	135	52	30	55
60	130	52	30	60
66	175	60	40	100
72	182	60	40	110
78	190	.....	40	110

LUGS



Size of Boiler, Inches	Weight, Lbs.	Size of Boiler, Inches	Weight, Lbs.
36	20	60	60
42	31	66	100
48	40	72	110
54	50	78	110

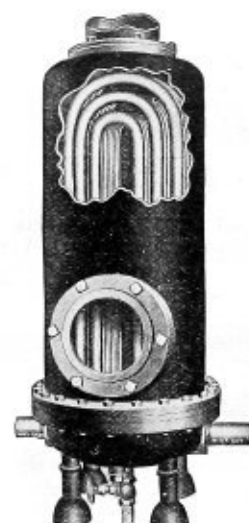


HAND-HOLE PLATE AND CRAB

In. . .	3x4	3 1/2 x 5 1/2	4x6	5x7	6x8	6x9
Lbs. . .	6	12	14	22	24	25

LUG PLATES

Size, 8x15 1/2 inches.
Weight, 15 lbs. each.


"NEW WATER TUBE" FEED WATER HEATER AND PURIFIER

This heater consists of a nest of U-shaped seamless drawn brass tubes, in the smaller sizes incased in a cast iron shell. In the larger sizes the shell is made of steel.

The exhaust steam enters the shell near the bottom, as shown in the cut, and is discharged from the outlet on the top of the heater.

The feed-water enters on the side near the bottom and is circulated through the nest of U-shaped seamless drawn brass tubes, and as it circulates it takes up the heat from the exhaust steam and after it has passed through the entire heating surface and is fully heated and not until then it enters the settling chamber at the bottom from which the impurities may be blown off; the hot water is then discharged from the chamber to the boilers from the outlet, on the side, near the bottom, as shown.

The heater is very compact and durable; the U-shaped brass tubes provide for the expansion and contraction, which insure against the tubes leaking. Ample provisions are made for the exhaust steam. The design of the bottom is such that after the water is taken in through the inlet it passes through a portion of the tubes, returns through another portion, repeating the process seven to ten times, depending on the size of the heater, before it is discharged into the settling chamber at the bottom. This construction gives a **positive and rapid water circulation**, makes every square inch of heating surface do its maximum duty, and produces a very high temperature in the feed water. One of the features of this heater which should not be overlooked, is the construction which enables one to remove the shell, tube sheet and tubes, for cleaning or repairs, if necessary, without disturbing the water, mud blow or drip connections or the supports upon which the heater rests.

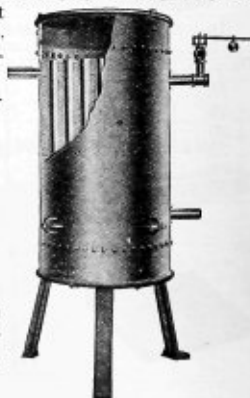
H. P.	Dimensions, Inches	Exhaust Openings, Inches	Weight, Lbs.	Price	H. P.	Dimensions, Inches	Exhaust Openings, Inches	Weight, Lbs.	Price
30	15 x 31	4	260	\$ 85.00	300	34 x 76	12	2,050	\$ 535.00
40	15 x 37	5	300	100.00	400	34 x 94	12	2,270	645.00
50	15 x 41	6	350	120.00	500	34 x 112	14	2,420	845.00
60	20 x 41	6	500	145.00	600	39 x 95	14	3,460	1,040.00
80	20 x 45	7	585	188.00	800	39 x 119	14	3,600	1,290.00
100	20 x 55	7	660	225.00	1,000	39 x 137	14	3,850	1,640.00
125	20 x 63	8	718	282.00	1,100	39 x 149	14	4,100	1,800.00
150	24 x 51	8	926	320.00	1,350	39 x 173	14	4,505	1,925.00
200	24 x 62	10	1,121	372.50	1,492	52 x 144	16	9,710	2,425.00
250	24 x 72	10	1,216	472.00	1,764	52 x 162	18	10,150	2,600.00

"STANDARD" FEED WATER HEATER

A popular form of vertical tubular closed feed water heater, simple in construction and efficient in operation. The inner heads are connected by tubes through which the exhaust steam passes from the lower steam chamber into the upper one, thence to the air without any back pressure on the engine. Constructed throughout of steel, with the exception of the top and bottom outside heads, which are of heavy reinforced cast iron, securely bolted to the shell and are easily removable. Handholes are conveniently placed to afford ready access for cleaning. The body of the heater is kept constantly full of water, surrounding the tubes through which the exhaust steam passes.

Number	700	701	702	703	704	705	706	707	708	709
Horse Power	25	30	40	50	70	100	150	200	250	350
Diameter, inches	20	20	20	25	25	30	30	36	42	42
Length over all, inches	43	43	48	50	50	61	68	78	85	85
Number 2-inch tubes	15	20	20	27	36	46	56	66	80	100
Length tubes, inches	30	30	36	36	36	42	48	54	60	60
Thickness shell, "	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
" heads, "	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Diam. exhaust, "	3	3 $\frac{1}{2}$	4	4	5	6	7	8	10	10
" feed pipe, "	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$
Size safety valve, "	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$
Weight, pounds	700	750	800	950	1,000	1,400	1,600	2,100	2,700	2,900
Price, with safety valve	130	140	150	170	180	210	235	285	360	400

Furnished with copper or brass tubes at an increased price.



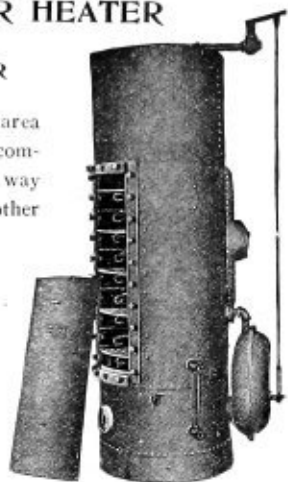
"STILWELL" FEED WATER HEATER**COMBINED WITH PURIFIER, FILTER AND LIME EXTRACTOR**

Has nine large corrugated shelves or pans which cover the entire area of the heater (with the exception of the area of the port which communicates from one pan to the other), and presents a most feasible way for rapidly and thoroughly separating and depositing the lime or other earthy salts contained in the water.

The filter is of the upward type, of large capacity, located immediately under the bottom shelf, convenient for the drawing or renewing of filter material.

The heater is equipped with automatic regulating device, which automatically controls the supply of cold water to the heater, maintaining a uniform water level without the constant attention of the engineer.

Fixtures Furnished—Steam and Water Flanges, Water Gauge, Bibb Cock and Cold Water Regulating Valve and Float.



Size	Price	Height of Heater	Diameter of Heater, Inches	Capacity in Horse Power	Heating Surface of Shelves	Internal Diameter of Exhaust Opening, Inches	Size of Hot Water Pipe, Inches	Distance from Center of Hot Water Pipe to Bottom of Heater, Inches	Size Cold Water Pipe, Inches	Size of Blow Off	Approx. Weight, Lbs.
B	\$ 160.00	5 ft. 5 in.	20	20 to 45	18.7 sq. ft.	3	1 1/4	8	1	1 1/2	675
C	230.00	6 " 5 "	24	50 " 100	26.	5	2	10	1 1/4	1 1/2	1000
D	300.00	8 " 0 "	30	75 " 150	39.6	7	3	13	1 1/4	2	1525
E	400.00	9 " 0 "	36	125 " 250	57.8	8	3	14	1 1/2	2	2400
E ²	500.00	9 " 0 "	42	175 " 350	81.3	9	4	14	1 1/2	2	3150
F	600.00	9 " 10 "	48	250 " 500	105.	10	5	14	2	2	4000
G	675.00	11 " 0 "	48	275 " 550	105.	12	5	14	2	2	4175
H	925.00	11 " 6 "	60	450 " 900	166.	14	5	18	2 1/2	2	7500
J	1200.00	12 " 9 "	66	600 " 1500	197.	18	6	18	3	3	9600

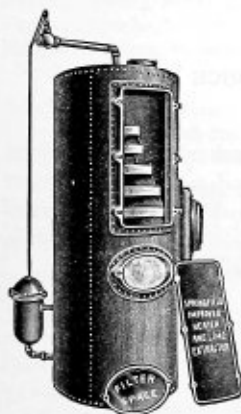
Openings given are maximum size.

THE "SPRINGFIELD" HEATER AND LIME EXTRACTOR

The water is admitted through the feed pipe in the top; passes over a series of pans surrounded by steam, heating the water to about 212 degrees, condensing nearly all the steam and precipitating the impurities. The water then filters through the lower chamber, which is filled with hay or fine excelsior, from which chamber it is discharged to the pump.

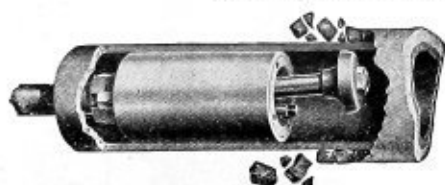
List No.	Approximate Horse Power	Diameter, Inches	Height, Inches	Cold Water Inlet, Inches	Hot Water Outlet, Inches	Exhaust Inlet and Outlet, Inches	Approximate Shipping Weight, Lbs.	Price
1	50-75	24	60	1 1/4	1 1/2	4	725	\$192.00
2	75-100	24	72	1 1/4	1 1/2	5	850	204.00
3	100-125	30	72	1 1/2	2	6	1100	216.00
4	125-150	30	84	1 1/2	2	6	1250	228.00
5	150-200	36	84	1 1/2	2	7	1400	268.00
6	200-250	36	96	2	2 1/2	8	1600	284.00
7	250-300	40	96	2	2 1/2	10	2200	328.00
8	350-400	48	120	2 1/2	3	10	2500	420.00

Prices include Automatic Feed Water Regulator and Oil Extractor.



THE "DEAN" IMPROVED STEAM OR COMPRESSED AIR BOILER TUBE CLEANER

Positively will not injure Boiler Tubes. Over 8,000 in Use



**Working in the Tube of a Return
Tubular Boiler**



**Working in the Tube of a Water
Tube Boiler**

Briefly stated, the Dean Cleaner is a small engine which works the tiny vibrator at the rate of from 3,000 to 6,500 times a minute. No hard blows are struck by this vibrator, since the rapidity and not the force of its strokes causes the scale to drop from the sides of the tubes.

As shown in the cut below, the Cleaner is attached to a hose, through which compressed air or steam power is supplied. It is then passed into the tubes and power is turned on. The hundreds of delicate strokes from the vibrator every minute knock the scale from the tubes, leaving them as clean and free from scale as when new.

The Dean Cleaner will not injure sound tubes and is the one sure device for detecting weak and burned out tubes which need repairs.

The Cleaner can be used for removing the scale from either the inside or outside of the tubes, thus rendering it applicable to either the ordinary type of return tubular boiler or the water tube boilers, or both.

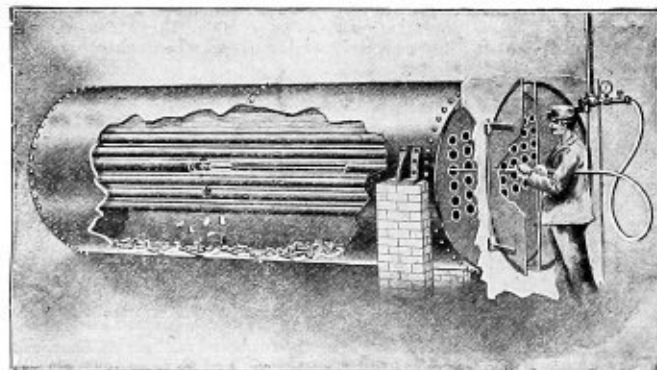
By means of additional attachments one Cleaner can be equipped for operating in two or more sizes of tubes within certain restrictions.

By means of the water tube hammer, which is a part of the equipment of every Cleaner we ship, the machine can be used for removing soot that has become baked hard on the inside of the tubes of an ordinary return tubular boiler.

When operating on water tube boilers for removing the scale from the inside of the tubes the Cleaner at the same operation also removes the soot from the outside of the tubes in from one-half to one-quarter of the time required by any other mechanical device known.

When operating in water tube boilers, due to the fact that the machine makes such a snug fit in the tubes, the operator is absolutely assured that after the Cleaner has traversed the length of the tube every particle of scale has been removed; otherwise the machine would stick and fail to pass the obstruction.

There are over 7,000 Dean Cleaners now in use in the United States, being adopted by most of the largest corporations in this country, and the number in use is in excess of all other Cleaners for like purposes combined.



PRICE LIST

No. 5, for 3 -inch tubes.....	\$93.75
No. 6, for 3½-inch tubes.....	93.75
No. 7, for 4 -inch tubes.....	93.75
No. 8, for 4½-inch tubes.....	100.00

Tubes measured by outside diameter.

In ordering, state make and style of boiler; also give size of tubes.

CHANNON "BULLOCK" STANDARD

SIDE OR DISC-CRANK VERTICAL SELF-CONTAINED
STEAM ENGINES

We present this style of engine as the most desirable form for general purposes where small powers are required.

They are highest grade in design, material and workmanship. They are built for hardest kind of work and long runs. Speed may be increased with entire safety.

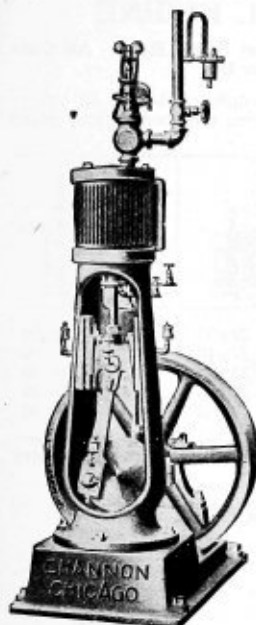
Every engine is thoroughly tested and placed in complete running order before leaving the shop and requires no further adjustment before starting.

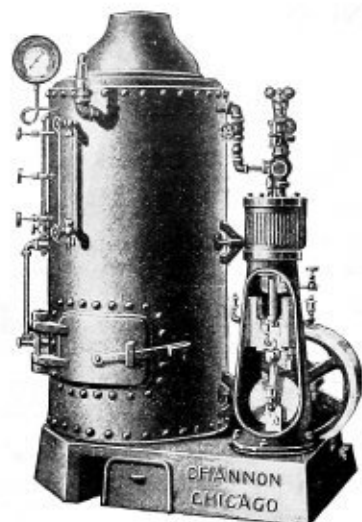
When engines are ordered complete, the following trimmings are included: Governor, governor belt, sight-feed cylinder lubricator, necessary oil cups for bearings, eccentric, cross-head pin and guides, drain cocks for cylinder and steam chest, throttle valve and nipples, also necessary wrenches.

SPECIFICATIONS AND PRICES

Size, Number	18	19	20	21	22	23	24
Horse-power as usually rated.....	1½	3	5	7	10	14	20
Size of Cylinder, inches.....	3 x 3	4 x 4	5 x 5	6 x 6	7 x 7	8 x 8	9 x 9
Revolutions per minute.....	300	250	250	200	190	180	160
Size of Steam-pipe, inches.....	½	¾	¾	1	1¼	1½	2
Diameter of Exhaust-pipe, inches.....	¾	1	1	1¼	1½	2	2½
Diameter of Shaft, inches.....	1½	1¾	1½	1½	2½	2½	2½
Diameter of Fly-wheel, inches.....	12	16	20	24	32	36	42
Face of Fly-wheel, inches.....	3	4	5	6	7	8	9
Height from floor to center of Shaft, in.	9	10	12	14	18	20	24
	Ft. In.	Ft.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
Height to top of Cylinder.....	2 6	3	3 7	4 5	5 1	5 8	6 7
Floor space occupied, inches.....	13 x 23	15 x 28	18 x 36	22 x 40	25 x 46	28 x 50	30 x 56
Weight of Engine, pounds.....	225	425	600	1,000	1,400	2,050	2,650
Price of bare Engine	\$65.40	\$107.05	\$138.50	\$174.80	\$240.12	\$319.64	\$356.16
Price of Oil-cups (four).....	2.40	2.40	2.60	2.60	2.92	2.92	2.92
Price of Sight-feed Lubricator.....	3.25	3.25	3.50	3.80	4.56	4.56	5.52
Price of Throttle Valve and Nipples...	1.25	1.50	1.50	1.80	2.10	2.28	3.40
Price of Governor	14.00	16.00	16.00	18.00	21.00	25.00	30.00
Price of Governor Belt .....	.70	.80	.90	1.00	1.30	1.60	2.00
Price of Engine, complete	\$87.00	\$131.00	\$163.00	\$202.00	\$272.00	\$356.00	\$400.00

Can furnish these Engines in "Center Crank," if desired, at same price





"BULLOCK" STANDARD VERTICAL ENGINE

Combined with Suitable Boiler Complete on Same Base. All Connections Made Ready for Use

The complete outfit as shown includes all engine fixtures, all necessary boiler fixtures, with injector fitted, all piping and connections made between engine and boiler.

Horse-Power Usually Rated	Size of Cylinder, Inches	Size of Boiler, Inches	Number of 2-Inch Tubes	Height from Floor to Top of Boiler, Feet	Floor Space, Inches	Shipping Weight, Lbs.	Price Complete as Shown
1½	3x3	20x36	16	3½	22x33	650	\$160.00
3	4x4	24x48	24	4½	27x40	1,800	260.00
5	5x5	27x60	30	6½	31x43	2,100	310.00
7	6x6	30x72	42	6½	36x55	3,000	410.00
10	7x7	36x72	60	6½	42x66	4,700	550.00

Exhaust pipe and stack not included but furnished at slight extra charge.

"BULLOCK" SELF-CONTAINED DISK-CRANK HORIZONTAL ENGINES

Suitable for all kinds of work where high speed and smooth running are required. The Engine being all complete on a single cast-iron base, prevents any of its working parts from becoming deranged or out of line. The material is of the best that can be obtained, and the workmanship excelled by none.

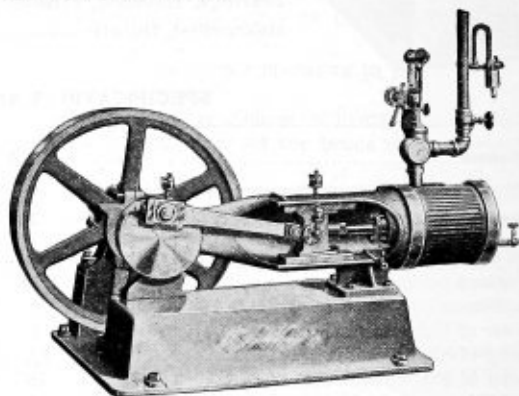
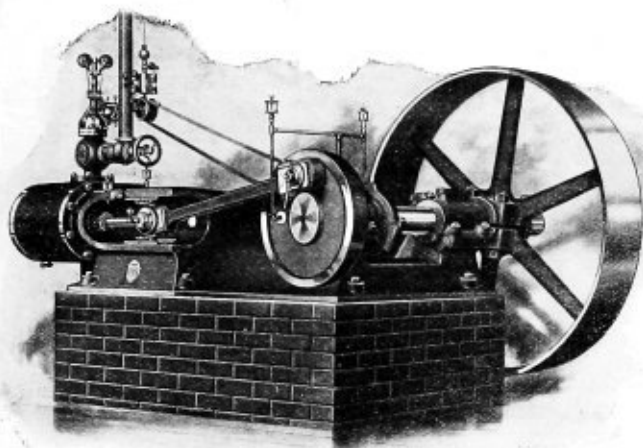


Table of Dimensions and Price List

Horse-power as usually rated	5	7	10	14	20
Size of Cylinder, inches.....	5x5	6x6	7x7	8x8	9x9
Revolutions per minute.....	250	200	190	180	160
Size of Steam-pipe, inches.....	¾	1	1¼	1½	2
Diameter of Shaft, inches.....	1½	1¾	2½	2½	2½
Diameter of Fly-wheel, inches.....	20	24	32	36	42
Face of Fly-wheel, inches.....	5	6	7	8	9
Floor space required, inches.....	29x34	31x38	41x46	46x52	48x57
Weight of Engine, pounds.....	600	900	1300	1800	2400
Price of Bare Engine.....	\$138.50	\$174.80	\$240.12	\$319.64	\$356.16
Price of Oil-cups (four).....	2.60	2.60	2.92	2.92	2.92
Price of Sight feed Lubricator.....	3.50	3.80	4.56	4.56	5.52
Price of Throttle Valve and Nipples.....	1.50	1.80	2.10	2.28	3.40
Price of Governor.....	10.00	18.00	21.00	25.00	30.00
Price of Governor Belt.....	.90	1.00	1.30	1.60	2.00
Price of Engine with trimmings.....	\$163.00	\$202.00	\$272.00	\$356.00	\$400.00

CLASS No. 100 MEDIUM SPEED THROTTLING ENGINES



Front View Self-Contained Engine—Class No. 100

These engines are built both right and left hand. In the absence of specific instructions the left-hand engine will always be furnished.

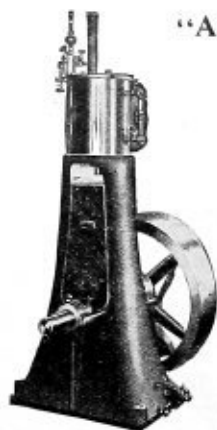
Unless we are advised to the contrary engines will be set to run overstroke. All engines 16x20 and smaller, unless otherwise specified, are made in the self-contained style as is shown by the illustration given above. Engines larger than 16x20 are always made in the detached style. Engines which are ordinarily made self-contained will be made detached when desired without additional price.

Reference Number	CYLINDER DIMENSIONS		Standard Number of Revolutions per Minute	Range of Horse Power at Standard Speeds with Different Steam Pressures.	MAIN SHAFT		BAND WHEEL		Diameter Steam Pipe, Inches	Size Governor, Inches	Diameter Exhaust Pipe, Inches	APPROXIMATE FLOOR SPACE REQUIRED		Approximate Shipping Weight, Pounds
	Diameter, Inches	Stroke, Inches			Diameter, Inches	Length, Inches	Diameter, Inches	Width Face, In.				Length, Inches	Width, Inches	
107	7	10	240	15 to 20	3 3/8	44	40	8 3/4	1 1/2	1 1/2	2 1/2	79	53	1,600
108	8	10	240	20 " 25	3 3/8	44	40	10 1/2	2 1/2	2 1/2	3	79	53	1,700
109	9	12	220	25 " 31	4 1/8	54	48	12 1/2	2 1/2	2 1/2	3	94	64	3,000
110	10	12	220	30 " 38	4 1/8	54	48	12 1/2	2 1/2	2 1/2	3 1/2	94	64	3,200
111	10	14	200	35 " 43	4 1/8	60	60	14 1/2	2 1/2	2 1/2	3 1/2	112	70	3,800
112	11	14	200	40 " 50	4 3/8	60	60	14 1/2	2 1/2	2 1/2	3 1/2	112	70	4,000
113	12	16	180	50 " 62	5 1/8	66	72	17 1/2	3	3	4	128	77	5,500
114	13	16	180	60 " 75	5 1/8	66	72	17 1/2	3	3	4	128	77	5,700
115	14	18	160	80 " 100	6 1/8	76	78	19 1/2	3 1/2	3 1/2	4 1/2	144	88	7,800
116	16	20	145	100 " 130	7 3/8	88	84	21 1/2	4	4	5	161	100	11,000
117	18	22	130	125 " 165	8 3/8	102	96	23 1/2	4 1/2	4 1/2	6	178	118	14,500

The fixtures included with each engine are: Band wheel of size given above, throttling governor with automatic stop, sawyers lever and adjustable speeder spring governor belt, angle throttle valve and nipple, sight feed cylinder lubricator and connections, cylinder drain cocks and nipples, special spanner wrench, air cock for valve and a complete oiling system, consisting of nickel-plated glass oiling cups for crank-wrist, eccentric, cross-head pin, rocker arm and top guide, and our special ball oiler for wrist pin, wipe oiler for cross-head, and drip oiler for eccentric. The items specifically enumerated above are all that are furnished with standard outfits. Anything else ordered will be charged for as an extra.

Speeds of engines can be changed from the standard speeds given in the above table, provided we are notified of the desired speed before shipment is made. If speeds are reduced it must be borne in mind that the power decreases also in proportion.

The regular finish of all standard Self-Contained or Detached Engines of this class includes the polishing of the connecting-rod brasses, cross-head, stuffing-boxes and valve rod; all other parts are carefully filed, sanded smooth and painted.



Front View

Every working part of this engine runs on oil, which is supplied by a pump in the base. It will run from three to six months without oiling or adjusting.

"ABC" VERTICAL HIGH PRESSURE SELF-OILING ENGINES

Type A

Designed to carry any steam pressure up to 150 pounds and run at speeds from 400 to 700 R. P. M. depending upon the size of the engine.

Adapted for isolated lighting plants, driving pumps, stokers, ash hoists, coal conveyors, elevators, driers, laundry machinery and the like.

They require but little attention and take up little room.

Being enclosed, they can run in very dirty and dusty places without injury.

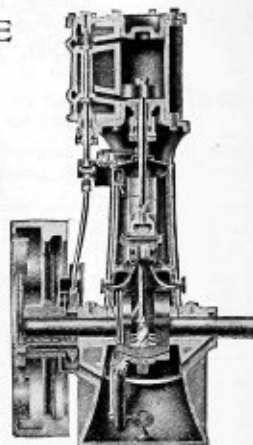


Fig. 7

Vertical section—showing arrangement of interior lubricating mechanism

Sizes and Prices

Size of Engine.....	4x4	5x5	6x6	7x7	9x7	10x5	12x6	14x7
Engine (without Wheel or Governor)	\$245	\$315	\$368	\$450	\$541	\$346	\$418	\$535
Hand Wheel.....	3	4	5	5	5	4	5	5
Pair Flanged Half Couplings (Fitted).....	12	16	17	18	18	16	17	18
Engine Complete for Blower Attachment.....	\$260	\$335	\$390	\$473	\$564	\$366	\$440	\$558
Net Weight, Lbs.....	400	680	875	1135	1250	930	1100	1335
Gross Weight, Lbs.....	500	830	1075	1380	1475	1125	1375	1540
Complete Automatic Engine.....	\$312	\$408	\$480	\$600	\$720	\$540	\$600	\$804
Anchor Bolts.....	2	2	3	3	3	2	3	3
Total.....	\$314	\$410	\$483	\$603	\$723	\$542	\$603	\$807
Net Weight, Lbs.....	535	880	1230	1700	1800	1090	1450	1900
Gross Weight, Lbs.....	625	1040	1450	1950	2075	1300	1650	2150
Throttling Governor (with pulleys and belt).....	\$37.00	\$44.00	\$44.00	\$52.00	\$70.00	\$52.00	\$84.00	\$102.00
Fly-wheel (without Governor).....	19.00	30.00	44.00	62.00	62.00	30.00	44.00	62.00
Out-Board Bearing, for Overhanging Wheel.....	26.00	32.00	40.00	45.00	45.00	32.00	40.00	45.00
Extended Sub-base, for Dynamo or Pump.....	35.00	45.00	55.00	60.00	60.00	45.00	55.00	60.00
Extended Shaft, for Dynamo.....	4.00	4.50	5.00	6.50	7.00	4.50	5.00	6.50

Price of engine includes sight-feed cylinder lubricator, throttle valve, automatic cylinder relief cocks, hardened steel wrenches and automatic pump-oiling system.

Price of automatic engine includes above fixtures and a fly-wheel with automatic governor.

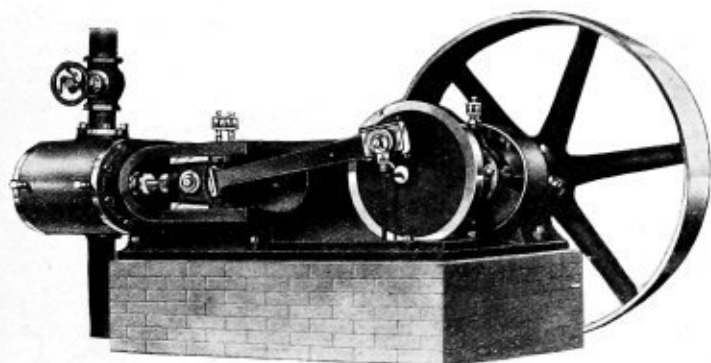
Price of throttling governor includes any of the standard makes.

Table of Horse Powers

Size of Engine	Steam Pres.	REVOLUTIONS PER MINUTE													
		250	275	300	325	350	375	400	425	450	475	500	550	600	700
4x4	80	2.55	2.8	3.05	3.3	3.55	3.8	4.05	4.3	4.6	4.85	5.1	5.6	6.65	7.75
	100	3.15	3.45	3.8	4.1	4.45	4.75	5.05	5.4	5.7	6.01	6.35	7.0	7.6	8.9
	125	3.95	4.3	4.72	5.1	5.5	5.9	6.3	6.7	7.1	7.49	7.85	8.65	9.45	10
	150	4.5	4.95	5.41	5.85	6.3	6.75	7.2	7.65	8.1	8.55	9.0	9.9	10.8	10
5x5	80	4.95	5.45	5.95	6.45	6.95	7.45	7.95	8.45	8.95	9.44	9.9	10.9	11.9	
	100	6.2	6.85	7.45	8.1	8.7	9.35	9.95	10.6	11.2	11.8	12.45	13.7	14.9	
	125	7.7	8.45	9.23	10.0	10.8	11.55	12.3	13.1	13.85	14.6	15.4	16	16	
	150	8.85	9.75	10.6	11.5	12.4	13.25	14.15	15.0	15.9	16	16	16	16	
6x6	80	8.55	9.45	10.27	11.15	12.0	12.85	13.7	14.5	15.4	16.2	17.15			
	100	10.7	11.75	12.84	13.95	15.0	16.05	17.15	18.2	19.25	20.3	21.4			
	125	13.25	14.1	15.92	17.25	18.6	19.9	21.25	22.6	23	23	23			
	150	15.15	16.7	18.22	19.75	21.25	22.75	23	23	23	23	23			
7x7	80	13.6	15.0	16.35	17.75	19.1	20.4	21.85	23.2	24.5					
	100	17.0	18.7	20.4	22.15	23.8	25.5	27.2	29.0	30.7					
	125	21.15	23.25	25.35	27.5	29.5	31.75	32	32	32					
	150	24.2	26.6	29.0	31.4	32	32	32	32	32					
9x7	60	16.8	18.5	20.3	21.9	23.6	25.3	26.9	28.6						
	70	19.6	21.6	23.6	25.6	27.6	29.5	31.4	32						
	80	22.5	24.8	27	29.3	31.5	32	32	32						
	90	25.3	27.9	30.4	32	32	32	32	32						

The heavy black line indicates slowest speed at which the automatic type will regulate. If engines are to operate at lower speeds, throttling governors must be used.

CLASS No. 600 HIGH SPEED AUTOMATIC CUT-OFF ENGINES



Front View Self-Contained Engine, Class No. 600

The main shaft bearings of these engines are provided with continuous chain oilers, fed from a reservoir below. The governor pin and the bearings on the rocker arm are provided with grease cups. All other bearings requiring lubrication have individual sight feed oil cups.

All engines 16x16 and smaller, unless otherwise specified, are made in self-contained style shown above, larger engines all made detached. All engines regularly made self-contained can be made detached if desired.

Reference Number	CYLINDER DIMENSIONS		Standard Number	Revolutions per Minute	Range of Power over which Engine is Used, Horse Power	MAIN SHAFT		BAND WHEEL		Diam. of Suction Pipe, inches	Diam. of Exhaust Pipe, inches	APPROX. FLOOR SPACE REQ.		APPROX. Shipping Weight, Lbs.
	Diam., inches	Stroke, inches				Diam., inches	Length, inches	Diam., inches	Width of Face, inches			Length, inches	Width, inches	
605	6	8	325		13 to 18	2 7/8	46	40	7 1/2	2	3	71	55	1,600
606	7	8	325		18 " 25	2 7/8	46	40	8 1/2	2	3	71	55	1,650
607	8	10	300		23 " 34	3 3/8	54	44	9 1/2	2 1/2	3 1/2	84	65	2,800
608	9	10	300		34 " 45	3 3/8	54	44	10 1/2	2 1/2	3 1/2	84	65	2,900
609	10	12	275		40 " 60	4 3/8	64	54	12 1/2	3	4	101	77	4,600
610	11	12	275		50 " 70	4 3/8	64	54	12 1/2	3	4	101	77	4,700
611	12	14	250		65 " 85	5 3/8	72	66	14 1/2	3 1/2	4 1/2	120	86	6,900
612	13	14	250		80 " 100	5 3/8	72	66	15 1/2	3 1/2	4 1/2	120	86	7,100
613	14	16	225		90 " 115	6 3/8	82	78	17	4	5	137	97	10,400
614	15	16	225		110 " 135	6 3/8	82	78	18	4	5	137	97	10,600
615	16	16	225		130 " 150	6 3/8	82	78	19	4 1/2	6	137	97	10,800
616	17	18	200		150 " 175	7 3/8	90	90	21	5	6	161	109	15,900
618	18	18	200		175 " 200	7 3/8	90	90	23	5	6	161	109	16,200

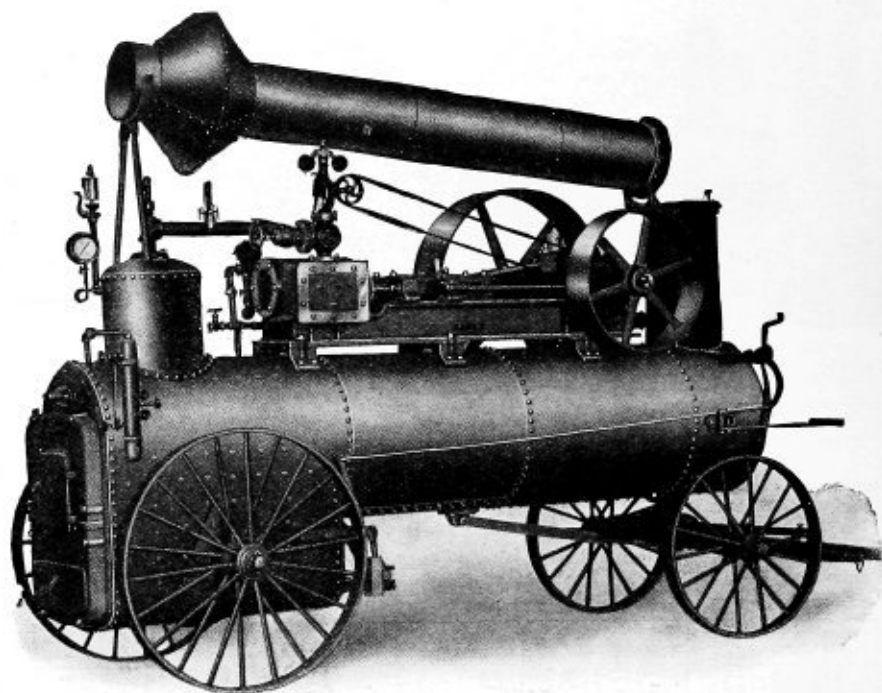
Engines of this type, as regularly made, are left-hand engines and will be so furnished unless specified to the contrary. Right-hand engines can, however, be furnished if desired.

The fixtures included with each engine are shaft governor, band flywheel, globe throttle valve, nickel-plated double glass sight feed cylinder lubricator and connections, nickel-plated grease cups for rocker arm connections and governor, cylinder drain cocks, valve for draining steam chest, special spanner wrench, oil gauges for self-oiling main shaft journals, and a complete oiling system consisting of oil cups for top guide, cross-head pin and eccentric, and our special ball oiler for crank pin and our improved positive boat oiler for the cross-head pin.

The regular finish of all standard self-contained and detached engines of this class includes the polishing of the connecting rod brasses, valve rod and eccentric rod; also the bands at the ends of cylinder and the rim of the crank disc. All other parts are carefully filled, sanded smooth and painted. Foundation plans and full directions for setting up and operating accompany each outfit.

PORTABLE ENGINES AND BOILERS COMPLETE

Mounted on Wheels



Regular prices include smoke stack, grates, safety valve, steam gauge, water gauge with water column, gauge cocks, whistle and pipe, blow-off, check and stop valves, pulleys, governor, throttle, pump, heater, governor belt, sight-feed lubricator, oil cups and pet-cocks; also pipe connection between engine and boiler, brake, hand suction pump, driver's seat, tool box, tongue, neckyoke, doubletree and whiffletrees. If any of these parts are not wanted, their price will be deducted.

Specifications

Number of Size	Horse-Power	Diam. of Cylinder & Lb. Stroke Inches	Ordinary No. Revolutions	Diam. of Pulleys in Inches	Face of Pulleys in Inches	Diam. of Boiler	Length Fire Box Inches	Width Fire Box Inches	Height Fire Box Inches	No. of 3-inch Tubes	Length of Tubes Inches	Estimated Weight Lbs.
0	6	4x 6	260	14 & 26	6½ & 6½	26	34	21	29	17	54	4,000
1	8	5x 8	240	14 & 32	10½ & 8½	28	36	22	32	18	60	4,400
2	9	6x 9	200	16 & 36	10½ & 9½	28	36	22	32	18	60	4,700
3	10	7x 9	200	16 & 36	10½ & 9½	30	38	24	34	22	72	5,400
4	12	7x10	190	20 & 44	10½ & 10½	32	38	26	38	26	72	6,300
5	15	8x10	190	20 & 44	10½ & 10½	32	44	26	38	26	78	6,800
6	20	8x12	190	22 & 48	10½ & 12½	34	52	28	38	30	90	8,300
7	25	9x12	190	32 & 48	8½ & 12½	36	52	30	40	34	96	10,100
8	30	10x12	190	32 & 54	8½ & 12½	36	52	30	40	34	102	10,700
9	35	10x15	160	36 & 60	9½ & 12½	40	52	34	44	40	102	12,700
10	40	11x15	160	36 & 60	9½ & 12½	40	60	34	44	42	120	14,000

MONARCH CORLISS ENGINES

SIMPLE—TANDEM OR CROSS COMPOUND—CONDENSING—MODERN IN DESIGN, HIGH IN EFFICIENCY, ACCURATE IN DETAILS

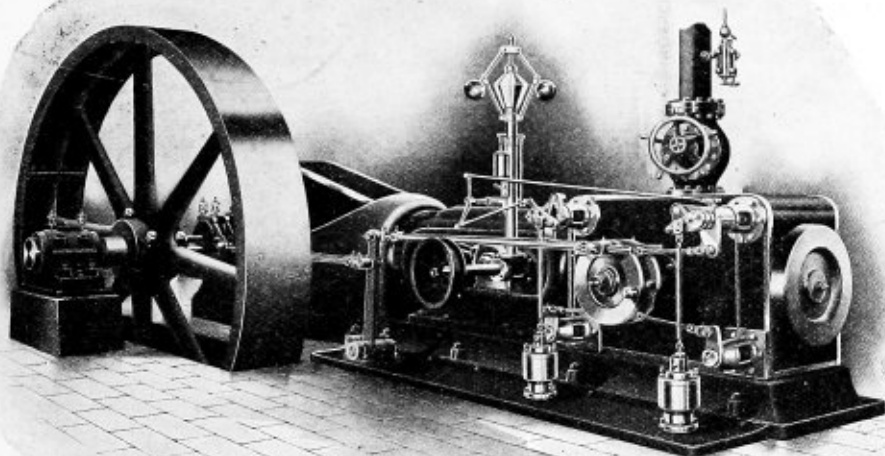
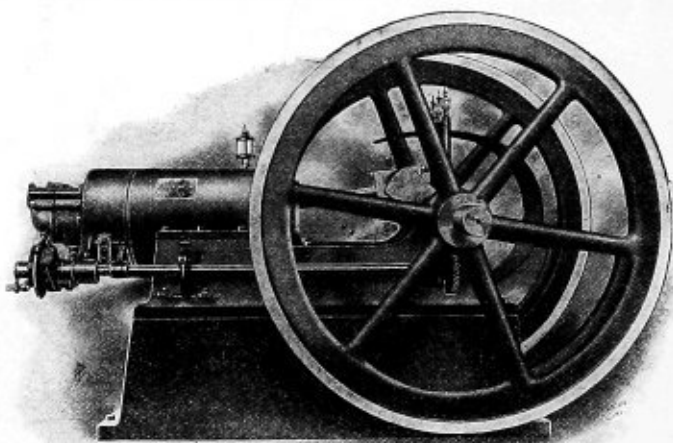


TABLE OF SIZES, SPEEDS AND INDICATED HORSE POWER

SIZE			INDICATED HORSE POWER												WHEEL			Main Bearing		Center of Shaft above Foundation, Inches	
Diameter, Inches	Stroke, Inches	Revolutions	80 LBS. PRESSURE		90 LBS. PRESSURE		100 LBS. PRESSURE		110 LBS. PRESSURE		125 LBS. PRESSURE		140 LBS. PRESSURE		Diameter, Feet	Face, Inches	Weight in lbs.	Diameter, Inches	Length, Inches		
			Cut-off		Cut-off		Cut-off		Cut-off		Cut-off		Cut-off								
			1-5	1-4	1-5	1-4	1-5	1-4	1-5	1-4	1-5	1-4	1-5	1-4							
12	30	90	54	65	62	74	69	83	77	89	89	102	101	116	9	15	5700	6	13	25	
12	36	85	61	73	70	84	78	94	87	101	101	116	114	131	10	17	6300	6	13	25	
14	36	85	83	100	95	114	107	128	119	138	137	158	126	179	10	19	8900	7	13	25	
14	42	82	93	112	107	128	120	144	134	155	154	178	175	201	12	19	8900	7	13	25	
16	36	82	105	126	120	144	135	162	150	174	173	200	197	226	12	21	10000	8	15	30	
16	42	78	116	139	133	159	150	179	167	193	192	221	218	250	12	23	11800	8	15	30	
18	36	80	129	155	148	177	166	199	186	215	214	246	243	279	12	25	13000	9	15	30	
18	42	78	147	176	168	202	189	227	211	245	244	281	276	317	14	23	13300	9	15	30	
18	48	75	162	195	185	222	208	249	232	269	268	308	303	348	15	25	15300	9	15	30	
20	42	75	175	210	200	240	225	270	250	290	289	333	328	376	15	25	16500	10	20	32	
20	48	72	192	230	219	263	246	296	275	318	317	365	360	412	16	27	18700	10	20	32	
20	60	65	216	260	248	297	279	334	310	359	358	413	406	466	16	31	24400	10	20	32	
22	42	75	211	254	242	290	271	326	303	351	350	403	396	455	16	29	18000	11	20	32	
22	48	72	232	278	265	318	298	358	333	385	385	443	436	500	16	33	23100	11	20	32	
22	60	65	262	314	299	359	336	404	376	435	433	499	490	563	18	35	26300	11	20	32	
24	48	70	268	322	307	368	345	414	385	446	444	511	503	577	18	35	24400	12	22	34	
24	60	65	311	374	356	427	401	481	448	518	515	594	584	671	20	40	28500	12	22	34	
26	48	70	315	378	360	432	405	486	452	523	521	600	590	677	18	42	29000	13	22	34	
26	60	65	366	439	418	502	470	564	525	608	602	693	682	784	20	48	34000	13	22	34	
28	48	68	355	426	406	487	457	548	510	590	588	677	666	765	20	44	31500	14	24	36	
28	60	65	424	509	485	582	545	654	609	705	700	807	794	912	22	50	36000	14	24	36	
30	48	68	464	557	531	637	597	717	667	772	770	886	872	1000	24	52	38500	15	24	36	
30	60	62	494	593	565	678	635	762	710	822	817	942	925	1062	24	60	52000	15	24	36	
32	48	65	443	532	507	608	570	684	637	737	734	845	832	955	24	48	34500	16	28	38	
32	60	62	529	634	604	725	680	816	759	878	875	1007	990	1137	24	60	43900	16	28	38	
32	72	55	563	675	643	772	723	868	808	935	931	1073	1055	1211	24	66	58200	16	28	38	
34	48	65	500	600	572	686	644	772	719	833	828	954	938	1077	24	50	39000	17	28	38	
34	60	62	597	716	682	813	767	920	857	992	987	1137	1118	1284	24	62	55000	17	28	38	
34	72	55	635	762	726	871	817	980	913	1056	1051	1211	1191	1367	24	74	69300	17	28	38	
36	48	62	535	642	611	749	688	825	759	892	886	1020	1003	1152	24	56	44300	18	32	40	
36	60	62	669	808	765	918	860	1032	961	1112	1107	1275	1254	1440	24	70	55500	18	32	40	
36	72	55	711	853	813	977	916	1099	1023	1184	1178	1357	1335	1532	26	72	75000	18	32	40	

Complete Specifications, Simple or Compound Engines, Furnished upon Request

“WITTE” GAS AND GASOLINE AND DISTILLATE ENGINES



Standard Stationary Engine on Sub-base

The Witte Engine is built on the well known four cycle principle; viz.—the first stroke draws a charge of fuel and air into the cylinder. Second: This charge is compressed to the highest possible point without causing premature ignition. Third: At the end of the previous stroke, ignition by an electric spark explodes the charge and the impulse or power therefrom is transmitted to and stored in the fly wheels. Fourth: All exhaust gases are discharged by the return of the piston; it is then ready to draw in another charge and so on.

It is of that type known as the Horizontal, all Vertical Valved engine, having two fly wheels, flat box form bed, with all parts detachable and renewable, if such should be required. It is as thousands of users will testify, simply a plain, strong, well and honestly made engine with ample horse power.

THE WITTE GASOLINE ENGINES have been examined and tested by the Underwriters Laboratories, are listed by the Consulting Engineers of the National Board of Fire Underwriters and conform with these rules so that the engines can be used in insured buildings.

SIZES AND DIMENSIONS

Actual Horse Power	Floor Space, inches	Height, inches	Revolutions per Minute	Plain Pulley, inches	Approximate Weight, pounds	Price Without Sub-base
4	33 x 50	34	325	10 x 8	1300	\$ 225.00
6	36 x 57	37	315	14 x 8	1700	275.00
9	42 x 72	42	280	16 x 7	3000	400.00
12	45 x 81	51	260	18 x 8	4400	500.00
15	47 x 84	54	250	20 x 8	5000	600.00
20	50 x 96	62	235	24 x 10	6500	800.00
25	52 x 100	64	225	28 x 10	7000	900.00
35	55 x 110	70	200	32 x 12	9500	1300.00

Engines are usually furnished without sub-base unless otherwise ordered.

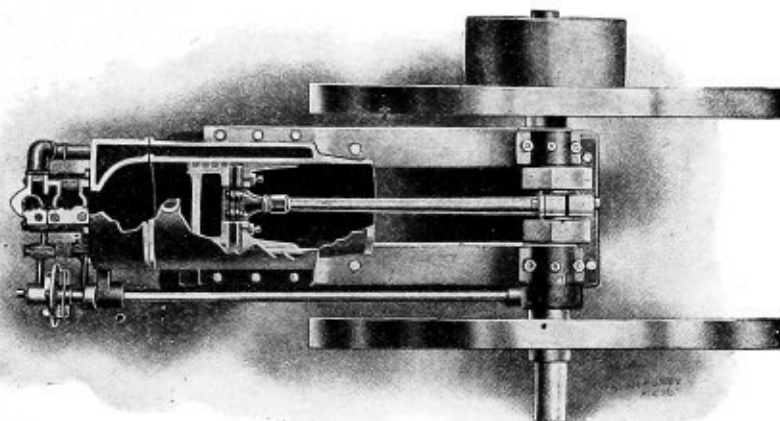
Standard Stationary Engines are equipped with plain drive pulley catalog size, water tank, one length water pipe, drain and fittings, gasoline pump, heavy ground gasoline tank, gasoline strainer, two lengths of suction, and two lengths of overflow gasoline pipe, with necessary fittings, exhaust muffler, one length exhaust pipe, foundation bolts, complete electric battery, wrenches, lubricator, oilers, foundation plans, instruction book, oil can and sample can of oil.

Gas Engines have gas bag, gas valve and one length of gas pipe in place of gasoline equipment.

For further description see pages following

DESCRIPTION OF THE "WITTE" STANDARD GASOLINE ENGINE

The selection of a good reliable gas or gasoline engine, by the inexperienced would be a very easy matter if he would simply confine his study to those engines possessing all or most of the following essentials of success in a gas engine, viz.—All vertical valves, phosphor bronze bearings, an adjustable connecting rod, reversible and renewable electrodes, hammer break ignition, a strong well braced box form bed, a good Guarantee and manufacturing facilities far superior to those in use in an ordinary job shop in order to produce that degree of perfection and accuracy necessary to the lasting and wearing qualities of an engine.



Sectional Top View of Engine

Note the simple arrangement of all parts, there are no gears inside of the two main crank bearings, making an offset thrust or strain, there is no governor in the fly wheel to get loose and race, there are no split hub wheels to come loose owing to the great strain, in fact there is nothing on the one end but two wheels, one crank and the bed.

The illustration shows the half spherical explosion chamber which, while it holds the usual amount of gas, does not expose but two-thirds the usual amount of wall surface to overheat, it also removes sharp corners and permits of higher compression, or in other words much greater power for the same fuel expense as well as more space for water cooling.

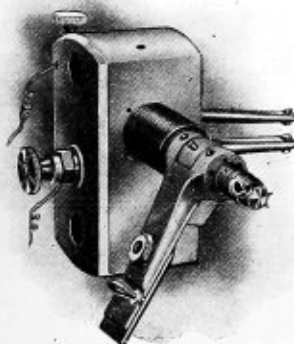
The gas enters and discharges in the center of the end of the cylinder, thus not only obtaining a very perfect, evenly distributed mixture, but also clearing the cylinder fully of foul gases. The Valve Pockets are not cast in the cylinder head but are entirely distinct and bolted on so they may also be removed.

Pulleys may be attached to either or both sides of the engine and no special pulleys bolted to the wheel spokes are required.

Notice the extension of the Cylinders to protect pistons from dust and grit and also to give them much greater wearing surface and life.

This Electric Igniter has been brought down to only two sources of trouble, natural wear of the electrode or the momentary fouling of same; a set of electrodes can be replaced in a minute, and as they are double sided, can be reversed in less. Should they be fouled, the igniter blade can be raised, jerked endwise twice and thereby cleaned while the engine is in motion.

The device is extremely simple. The electrodes make contact slowly and surely but separate instantly, making a hot and "fat" spark just when and where it is needed.

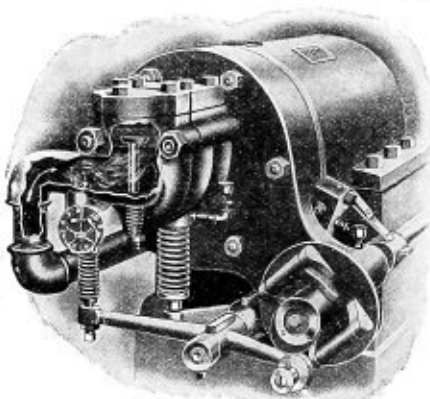


Witte Igniter

DESCRIPTION OF THE "WITTE" STANDARD GASOLINE ENGINE

(Continued)

ENTIRE VALVE PLAN



Showing Cylinder Head, Valves, Governor and Cams

Both levers have adjusting screws at the bottom of the stem for taking up any slight wear while engine is running.

The idea of placing Valves in the heads is a very dangerous and expensive plan for two reasons, 1st, should a spring or nut come off (and they do) the valve is drawn into the cylinder and things badly wrecked by the piston. 2nd, if wrecked or requiring regrinding the entire cylinder head must be removed and the packing broken before a valve can be reached, a very expensive and time consuming job.

The Witte Engine draws in a fresh charge of air at every suction. It only draws fuel as required by the governor; therefore very economical in the use of fuel, and air costing nothing is used for cooling and clearing the cylinder of its old or foul gases so the engine does not overheat. This is not the case by any means in an engine using the old idea of holding the exhaust valve open, for by that plan you draw all the old hot gases back and forth from the exhaust pipe and muffler at every stroke, causing a great loss of power as well as injury to the engine in overheating and besides requiring very large water tanks.

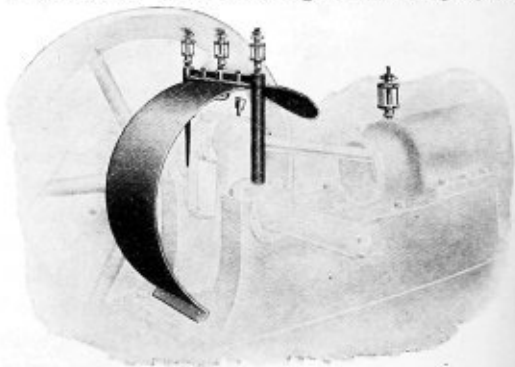
No change in the fuel regulating valve is necessary after the engine is once properly started, no matter what the load or temperature of the weather may be.

The oiling system of a gasoline engine is of the greatest importance. We illustrate herewith the oil shield and oil cups as furnished on Witte engines, placing the oilers in view so that they can be filled at any time while the engine is in operation. The flow of oil can be adjusted to suit temperature or grade of oil. In this way the moving crank is protected and the operator can tell at a glance that every bearing is receiving the proper amount of oil.

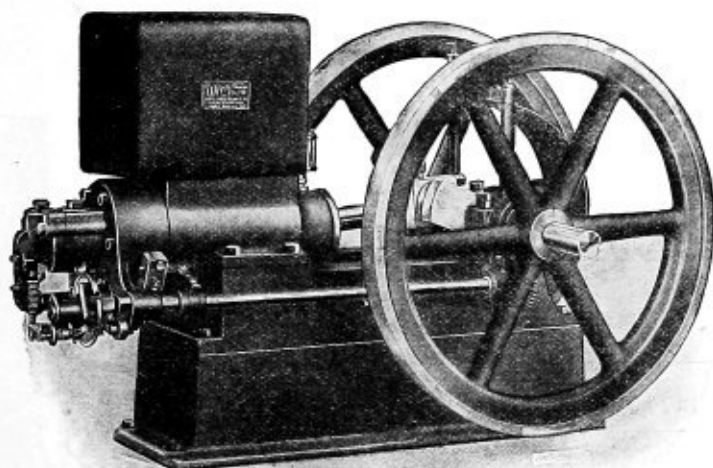
A distinctive feature of the **WITTE** Engine is the three valves which are all Vertical, with Heads on top and all self-closing.

It is recognized by every gas engine expert that a horizontal valve will saw out its stem and bearing in a short while, for it is almost impossible to sufficiently lubricate them and the moment a stem wears, say only 1/64 of an inch, it means that the 2½ to 4-inch valve head has just that much opening or leak all around its seat, and a valve which once leaks soon cuts or burns out rapidly.

In the Witte it will be seen every valve is Vertical and there is no strain on the stem; its operation is like a broom placed on the end of your finger, the only friction is at the bottom **ON** your finger.



"WITTE" HOPPER COOLED STATIONARY ENGINES



In the smaller sizes of gasoline engines, the simple and reliable Hopper Cooled is fast displacing other types, be they Air Cooled, Fan Cooled or Uprights. It certainly is an ideal engine for a quick start or a 10 hour run; it is always ready, requires but little space, has no tanks, pipes or leaky fittings.

For the average blacksmith or small machine or carpenter shop no better, cheaper or quicker power is to be obtained, all on one base, no projecting or overhanging attachments, requires no expert, or erector, but comes to the purchaser complete, thoroughly tested, and needs no adjusting or fitting up.

We guarantee if hopper is filled when required that it will never burn or overheat, will not warp the cylinder, piston or rings. Will run more economically on account of more uniform temperature than standard engines, except when standard engine is used enough to thoroughly heat the water in the tank.

The hopper is of generous size and is built separate from the cylinder and can at any time be taken off. The side of the hopper is tapped and plugged so that a barrel or tank can be connected up and used by anyone desiring it. If at a later date the water tank plan is desired a plate can be furnished in exchange for the hopper. This plate fits over the cylinder and is arranged for pipe connection. In this way the engine can be purchased as a hopper-cooled engine and later used in either way the purchaser prefers. Suitable arrangements are made for draining the hopper and cylinder.

SIZES AND DIMENSIONS

Actual Horse Power	Rev. Per Minute	Plain Pulley, inches	Floor Space, inches	Height, inches	Weight, lbs.	Price Without Sub-base
4	325	10 x 8	33 x 50	34	1200	\$200.00
6	315	14 x 8	36 x 57	37	1600	240.00
9	280	16 x 7	42 x 70	43	2700	350.00
12	260	18 x 8	45 x 80	51	4000	475.00
15	250	20 x 8	46 x 82	54	4300	550.00

Equipment consists of plain drive pulley, gasoline tank mounted on hopper, globe valve, gasoline strainer, drain, water hopper cooler with drain valve, complete electric battery, lubricator, oilers, oil can, attached flange exhaust muffler, wrenches and instruction book.

Gasoline pump plan with pipes and ground tank furnished on order in place of the mounted tank. Gas engines are equipped with gas cock and gas bag.

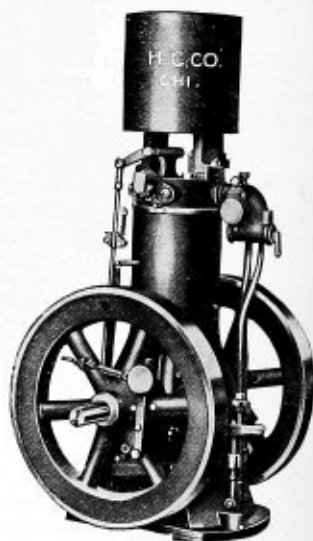
"B AND E" VERTICAL GASOLINE ENGINES

With Cast Cooling Tank on Top

This makes a very compact outfit; the tank is firmly secured to top of engine and both inlet and outlet pipes connect with water jacket so that natural circulation is obtained. A draw-off cock is placed at the lowest point so that water may be quickly removed. Gasoline in base of engine.

Size	Height, Inches	Speed, R. P. M.	Pulley, Inches	Floor Space, Inches	Weight, Lbs.	Price
1½ H. P.	42	350 to 400	6x3	16x18	325	\$130.00
2½ H. P.	45	350 to 400	6x4	18x24	500	150.00
4 H. P.	57	300 to 350	8x5	24x30	950	215.00
6 H. P.	62	325 to 350	10x6	30x36	1,250	315.00

Price includes batteries, muffler, oil can, wrenches, hose and nipples, shut-off cocks, lag screws, 1-gallon can of cylinder oil, lubricators; in fact, a complete outfit.



No. 3 COMBINED PUMP AND GASOLINE ENGINE

This is the "B and E" engine listed above, combined on same base with a double-acting pump.

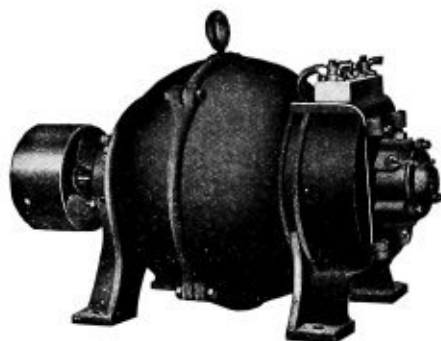


Combined Pump and
"B and E" Engine

Size of Engine	1½ Horse Power	4 Horse Power
Pump Cylinder	4 inch	6 inch
Stroke	4 inch	6 inch
Strokes, per Minute	40 to 45	40 to 45
Suction	1¼ inch	2½ inch
Discharge	1¼ inch	2 inch
Capacity	900 gallons per hour	4,000 gallons per hour
Total Lift	125 feet	150 feet
Gear Ratio	7 to 1	7 to 1
Face of Gears	1½ inch	2 inch
Pitch of Gears	6	4
Weight	700 lbs.	1,500 lbs.
Price	\$220.00	\$350.00

LUNDELL ROUND TYPE DIRECT CURRENT MOTORS

SINGLE FIELD COIL



These Round Type Motors are compact, efficient and durable, having the windings and moving parts thoroughly protected.

They are made of selected materials by skilled workmen and are of the highest type of design.

The thoroughness of construction enables these motors to operate satisfactorily under the most severe conditions of service.

They may be attached to floor, wall or ceiling or arranged for vertical operation.

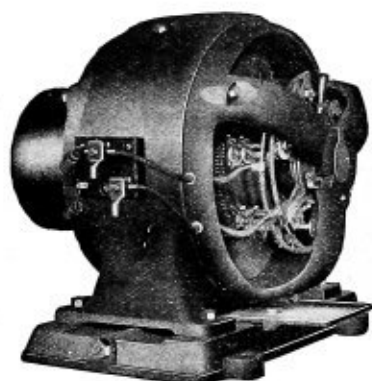
Sizes and Specifications

Frame No.	H. P.	Volts	Approx Speed, R.P.M.	PULLEY, INCHES		Approx Weight Lbs.	List Price, Shunt Wound	Frame No.	H. P.	Volts	Approx Speed, R.P.M.	PULLEY, INCHES		Approx Weight Lbs.	List Price, Shunt Wound
				Diam.	Face							Diam.	Face		
1-20	$\frac{1}{20}$	115	2100	1 $\frac{1}{4}$	V	30	\$ 18.50	1	1 $\frac{1}{2}$	115	1575	4	3	220	\$105.00
	$\frac{1}{20}$	230	2100	"	"	"	19.50		1 $\frac{1}{2}$	230	1575	"	"	"	110.00
1-10	$\frac{1}{10}$	115	1800	2 $\frac{1}{2}$	V	40	24.70		1 $\frac{1}{2}$	500	1600	"	"	"	110.60
	$\frac{1}{10}$	230	1800	"	"	"	27.50	2	2	115	1150	7	3 $\frac{1}{2}$	375	166.00
1-6	$\frac{1}{6}$	115	1650	2 $\frac{3}{4}$	1 $\frac{1}{2}$	50	54.00		2	230	1150	"	"	"	170.00
	$\frac{1}{6}$	230	1650	"	"	"	56.00		2	500	1350	"	"	"	174.00
	$\frac{1}{4}$	115	2400	"	"	"	56.00		3	115	1750	5	4 $\frac{1}{2}$	"	165.00
	$\frac{1}{4}$	230	2400	"	"	"	59.00		3	230	1750	"	"	"	168.00
	$\frac{1}{4}$	500	2000	"	"	"	59.00		3	500	2000	"	"	"	178.00
1-4	$\frac{1}{4}$	115	1500	3 $\frac{1}{2}$	1 $\frac{1}{2}$	93	71.00	3	3	115	1150	5	4	450	206.00
	$\frac{1}{4}$	230	1500	"	"	"	87.00		3	230	1150	"	"	"	212.00
	$\frac{1}{4}$	500	1500	"	"	"	80.00		3	500	1300	"	"	"	219.00
	$\frac{3}{8}$	115	2500	2	1 $\frac{1}{2}$	"	72.00		4	115	1450	"	"	"	218.00
	$\frac{3}{8}$	230	2500	"	"	"	74.00		4	230	1450	"	"	"	224.00
1-2	$\frac{1}{2}$	115	1350	5	2	145	86.00	4	4	500	1750	"	"	"	222.00
	$\frac{1}{2}$	230	1350	"	"	"	87.00		4	115	1150	5	4	625	230.00
	$\frac{1}{2}$	500	1500	"	"	"	90.00		4	230	1150	"	"	"	238.00
	$\frac{3}{4}$	115	2000	3	2 $\frac{1}{2}$	"	84.00		4	500	1300	"	"	"	228.00
	$\frac{3}{4}$	230	2000	"	"	"	86.00		5	115	1550	"	"	"	212.00
1-2 S	$\frac{3}{4}$	500	1925	"	"	"	90.00		5	230	1550	"	"	"	222.00
	$\frac{3}{4}$	115	1300	5	2	150	88.00	5	5	115	1100	5 $\frac{1}{2}$	5	685	256.00
	$\frac{3}{4}$	230	1300	"	"	"	90.00		5	230	1100	"	"	"	260.00
	$\frac{3}{4}$	500	1425	"	"	"	95.00		5	500	1250	"	"	"	270.00
	1	115	1200	6	2 $\frac{3}{4}$	220	102.00	7 1-2	7 $\frac{1}{2}$	115	1050	7	6	890	350.00
1	1	230	1200	"	"	"	106.00		7 $\frac{1}{2}$	230	1050	"	"	"	372.00
	1	500	1325	"	"	"	109.00		7 $\frac{1}{2}$	500	1150	"	"	"	380.00

List prices include pulleys, slide rails, wood base, frames, and automatic no-voltage release starting rheostats, except as follows: $\frac{1}{20}$ and $\frac{1}{10}$ H. P. and the $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{2}$ S and 1 H. P. are without slide rails or base.

For List of Compound Wound Motors of standard rating add 3 % to above.

SPRAGUE TYPE "D" DIRECT CURRENT MOTORS



The Type D Motors possess features which afford copious ventilation of the windings, generous overload capacities, high efficiencies, durability, compactness and excellent variable speed qualities.

In order to adapt these motors to various conditions of service they are made in three types: Open, semi-enclosed, and entirely enclosed.

The entirely enclosed motors have cast iron covers placed in the openings in both the front and rear end brackets. The covers on the two smaller frames are hinged to the brackets, but on the larger frames the covers are held in the openings by spring clamps.

Semi-enclosed motors, instead of the solid covers mentioned above, have perforated covers which prevent the entrance of metallic or other chips but allow a circulation of air through the machine.

Type D Motors are supplied with shunt, series or compound field windings.

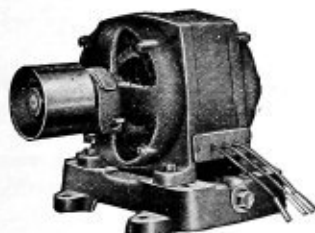
Sizes and Specifications

Frame No.	H. P.	Volts	Approx. Speed, R. P. M.	PULLEY, INCHES		Approx. Weight, Lbs.	List Price, Open
				Diam.	Face		
10	10	115	825	9 1/2	7 1/2	1,236	\$430.00
	10	230	825	9 1/2	7 1/2	1,236	440.00
	10	500	1,000	9 1/2	7 1/2	1,236	456.00
	15	115	1,250	9 1/2	7 1/2	1,236	436.00
	15	230	1,250	9 1/2	7 1/2	1,236	450.00
	15	500	1,500	9 1/2	7 1/2	1,236	470.00
15	15	115	700	11	8 1/2	1,660	574.00
	15	230	700	11	8 1/2	1,660	588.00
	15	500	775	11	8 1/2	1,660	606.00
	20	115	1,100	11	8 1/2	1,660	580.00
	20	230	1,100	11	8 1/2	1,660	580.00
	20	500	1,175	11	8 1/2	1,660	610.00
20	20	115	750	16	8	1,715	740.00
	20	230	750	16	8	1,715	740.00
	20	500	825	16	8	1,715	780.00
	25	115	875	16	8	1,715	736.00
	25	230	875	16	8	1,715	768.00
	25	500	975	16	8	1,715	810.00
25	25	115	725	16	8	1,900	824.00
	25	230	725	16	8	1,900	798.00
	25	500	800	16	8	1,900	854.00
	30	115	825	16	8	1,900	896.00
	30	230	825	16	8	1,900	850.00
30	30	115	700	18	11	2,200	950.00
	30	230	700	18	11	2,200	920.00
	25	500	700	18	11	2,200	920.00
	35	115	780	18	11	2,200	990.00
	35	230	800	18	11	2,200	980.00
	35	500	1,080	18	11	2,200	910.00
40	40	115	650	18	11	2,535	\$1,150.00
	40	230	650	18	11	2,535	1,140.00
	40	500	775	18	11	2,535	1,150.00
	50	115	850	18	11	2,535	1,060.00
	50	230	850	18	11	2,535	1,080.00
	45	500	860	18	11	2,535	1,120.00
50	50	115	625	16	13	3,550	1,362.00
	50	230	625	16	13	3,550	1,358.00
	50	500	725	16	13	3,550	1,290.00
	60	115	775	16	13	3,550	.....
	60	230	775	16	13	3,550	.....
	60	500	850	16	13	3,550	.....
60	60	115	600	.....	.....	4,100	.....
	60	230	600	.....	.....	4,100	.....
	60	500	650	.....	.....	4,100	.....
	75	115	750	.....	.....	4,100	.....
	75	230	750	.....	.....	4,100	.....
	75	500	800	.....	.....	4,100	.....
75	75	115	550	.....	.....	4,925	.....
	75	230	550	.....	.....	4,925	.....
	75	500	600	.....	.....	4,925	.....
	90	115	675	.....	.....	4,925	.....
	90	230	675	.....	.....	4,925	.....
90	90	115	480	.....	.....	7,940	.....
	90	230	480	.....	.....	7,940	.....
	90	500	500	.....	.....	7,940	.....
	105	115	670	.....	.....	7,940	.....
	105	230	670	.....	.....	7,940	.....
	105	500	700	.....	.....	7,940	.....

Prices include pulleys, belt-tightening bases and automatic No. voltage release starting rheostats. For compound wound motors of standard rating add 3 per cent to above prices.

SPRAGUE POLYPHASE INDUCTION MOTORS

60 CYCLE—TWO AND THREE PHASE



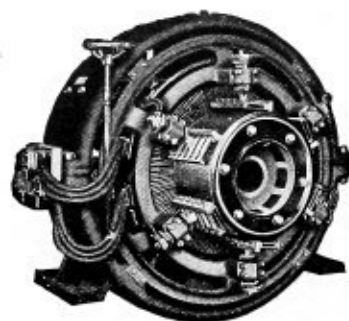
Form "F" Riveted Frame



Form "G" Skeleton Frame

Type and Frame No.	No. of Poles	SPEED		Volts	PULLEY, INCHES		WEIGHTS		PRICES	
		H. P.	R. P. M.		Diam.	Face	Form "F"	Form "G"	Form "F"	Form "G"
R120	6	3/4	1200	110—220—440—550	4	2 1/2	100	....	\$ 116.00	.....
R112	4	1	1800	110—220—440—550	3 1/2	1 3/4	100	....	104.00	.....
R122	6	1 1/2	1200	110—220—440—550	4	2 1/2	150	....	138.00	.....
R122	4	2	1800	110—220—440—550	4	2 1/2	150	....	126.00	.....
R140	6	2	1200	110—220—440—550	4 1/2	3 1/2	190	....	160.00	.....
R140	4	3	1800	110—220—440—550	4 1/2	3 1/2	190	....	144.00	.....
R160	6	3	1200	110—220—440—550	4 1/2	4 1/2	250	....	186.00	.....
R160	4	5	1800	110—220—440—550	4 1/2	4 1/2	250	....	158.00	.....
R180	6	5	1200	110—220—440—550	5	4 1/2	420	....	240.00	.....
S200	8	5	900	110—220—440—550	8	4	495	....	308.00	.....
R180	4	7 1/2	1800	110.....	5	4 1/2	550	....	310.00	.....
R180	4	7 1/2	1800	....—220—440—550	5	4 1/2	550	....	300.00	.....
R200	4	7 1/2	1800	110.....	8	4	....	325	.....	\$ 310.00
R200	4	7 1/2	1800	....—220—440—550	8	4	....	325	.....	300.00
R201	6	7 1/2	1200	110.....	8	4	625	500	404.00	404.00
R201	6	7 1/2	1200	....—220—440—550	8	4	625	500	392.00	392.00
R181	4	10	1800	110.....	5	4 1/2	520	....	384.00	.....
R181	4	10	1800	....—220—440—550	5	4 1/2	520	....	374.00	.....
R200	4	10	1800	110.....	8	4	....	480	.....	384.00
R200	4	10	1800	....—220—440—550	8	4	....	480	.....	374.00
S 8	6	10	1200	110.....	8	4 1/2	865	720	458.00	458.00
S 8	6	10	1200	....—220—440—550	8	4 1/2	865	720	448.00	448.00
S 9	8	10	900	110.....	8	6	875	730	514.00	514.00
S 9	8	10	900	....—220—440—550	8	6	875	730	502.00	502.00
R201	4	15	1800	110—220—440—550	8	4	640	520	474.00	474.00
S 9	6	15	1200	110—220—440—550	8	6	910	770	518.00	518.00
S 10	8	15	900	110—220—440—550	10	7	1200	1035	606.00	606.00
S 10	6	20	1200	110.....	10	7	1220	1070	650.00	650.00
S 10	6	20	1200	....—220—440—550	10	7	1220	1070	616.00	616.00
S 11	8	20	900	110.....	10	8	1470	1220	694.00	694.00
S 11	8	20	900	....—220—440—550	10	8	1470	1220	660.00	660.00
S 11	6	25	1200	110.....	10	8	1470	1220	702.00	702.00
S 11	6	25	1200	....—220—440—550	10	8	1470	1220	670.00	670.00
S 12	10	25	720	110.....	13	9	1850	1760	882.00	882.00
S 12	10	25	720	....—220—440—550	13	9	1850	1760	848.00	848.00
S 11A	6	35	1200	....—220—440—550	10	10	1600	1520	800.00	800.00
S 11A	6	35	1200	2080.....	10	10	1600	1520	1000.00	1000.00
S 12	10	35	720	....—220—440—55	13	9	1950	1760	968.00	968.00
S 13	8	50	900	....—220—440—5	13	13	2330	2060	1000.00	1000.00
S 13	8	50	900	2080.....	13	13	2330	2060	1188.00	1188.00
S 14	14	50	514	....—220—440—50	19	15	3700	3500	1474.00	1474.00

Prices are for belt drive and include C. I. sliding base, pulley and boxing. Form F motors, 5 H. P. and smaller do not include compensators, list for 5 H. P. 110 volt add \$100.00 and for other voltages \$90.00 to above list. Only slow speed motors are suitable for gearing.



SPRAGUE GENERATORS

Round Type—made in sizes $\frac{1}{4}$ to $6\frac{1}{4}$ K. W. They are bi-polar, compact and efficient.

Type "D"—made in sizes $8\frac{3}{4}$ to 90 K. W. for both slow and moderate speeds.

Type "S"—made in sizes 25 K.W. and up, and constructed in accordance with the best modern practice. Designed to meet the demand for first-class service in modern central stations, hotels, office and apartment buildings where economy of floor space, quietness, high efficiency and low depreciation are matters of great importance.

ROUND TYPE GENERATORS

K. W.	Volts	Approx. Speed	Approx. Weight	Price	K. W.	Volts	Approx. Speed	Approx. Weight	Price
$\frac{1}{4}$	125	2000	93	.....	2	250	1425	375	.....
$\frac{1}{4}$	250	2000	93	.....	$2\frac{1}{4}$	125	1400	450	.....
$\frac{1}{2}$	125	1750	145	.....	$2\frac{1}{4}$	250	1400	450	.....
$\frac{1}{2}$	250	1750	145	.....	$3\frac{1}{2}$	125	1400	625	.....
$\frac{3}{4}$	125	1650	150	.....	$3\frac{1}{2}$	250	1400	625	.....
$\frac{3}{4}$	250	1650	150	.....	$4\frac{3}{8}$	125	1350	685	.....
1	125	1500	220	.....	$4\frac{3}{8}$	250	1350	685	.....
1	250	1500	220	.....	$6\frac{1}{4}$	125	1300	890	.....
2	125	1425	375	.....	$6\frac{1}{4}$	250	1300	890	.....

SLOW SPEED

TYPE "D" GENERATORS

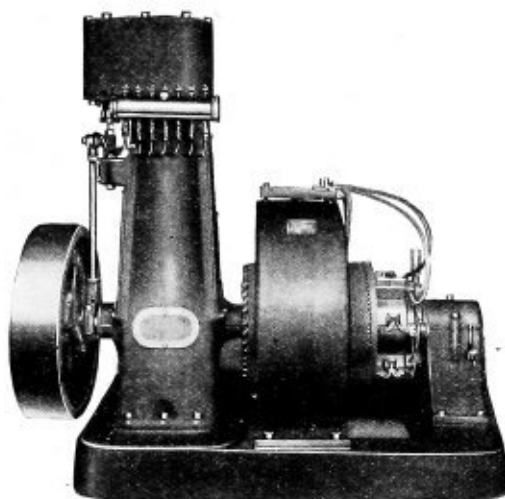
MODERATE SPEED

8 $\frac{3}{4}$	125	1025	1236	.....	12 $\frac{1}{2}$	125	1550	1236	.....
8 $\frac{3}{4}$	250	1025	1236	.....	12 $\frac{1}{2}$	250	1550	1236	.....
12 $\frac{1}{2}$	125	870	1660	.....	17 $\frac{1}{2}$	125	1350	1660	.....
12 $\frac{1}{2}$	250	870	1660	.....	17 $\frac{1}{2}$	250	1350	1660	.....
17 $\frac{1}{2}$	125	900	1715	.....	22 $\frac{1}{2}$	125	1050	1715	.....
17 $\frac{1}{2}$	250	900	1715	.....	22 $\frac{1}{2}$	250	1050	1715	.....
22 $\frac{1}{2}$	125	875	1900	.....	27 $\frac{1}{2}$	125	975	1900	.....
22 $\frac{1}{2}$	250	875	1900	.....	27 $\frac{1}{2}$	250	975	1900	.....
27 $\frac{1}{2}$	125	850	2200	.....	32	125	950	2200	.....
27 $\frac{1}{2}$	250	850	2200	.....	32	250	950	2200	.....
35	125	775	2535	.....	42 $\frac{1}{2}$	125	950	2535	.....
35	250	775	2535	.....	60	125	925	5700	.....
42 $\frac{1}{2}$	125	650	5700	.....	60	250	925	5700	.....
42 $\frac{1}{2}$	250	650	5700	.....	75	125	850	6980	.....
55	125	625	6980	.....	75	250	850	6980	.....
55	250	625	6980	.....	90	125	750	7940	.....
75	125	550	7940	.....	90	250	750	.....	.....
75	250	550	7940	.....				

DIRECT DRIVEN TYPE "S" GENERATORS

25	125	305	3300	.....	100	125	260	8600	.....
25	250	305	3300	.....	100	250	260	8600	.....
35	125	300	3600	.....	125	125	250	10750	.....
35	250	300	3600	.....	125	250	250	10750	.....
50	125	290	4300	.....	150	125	225	13500	.....
50	250	290	4300	.....	150	250	225	13500	.....
75	125	275	6000	.....	200	125	200	18000	.....
75	250	275	6000	.....	200	250	200	18000	.....

"No. 85" DIRECT-CONNECTED GENERATING SETS



These complete lighting sets are well designed, compact and low in operating cost, consume least possible steam and require but little attention.

Used by contractors for lighting dredges and steam shovels; for marine work, also for independent light plants of every kind. All bearings are large and easily adjusted. All working parts have a perfect lubricating system, oil being distributed to all bearings from one oil reservoir having glass ends. Every branch oil tube has an adjustable sight feed, showing at a glance the amount of oil in tank and the amount flowing to each bearing.

Engines:—are of the automatic cut-off type with balanced piston valve. The cranks are of the best forged steel and counter-balanced. The steel connecting rods have extremely wide babbitted bearings in the lower end and bronze boxes in the upper end. The cross heads are of the wedge block type and are fitted with adjustable phosphor-bronze shoes. Piston rod is screwed into the cross head with lock nut. Pipe connections can be made from either side of cylinder. Generators are of the six-pole type.

The armatures are of the iron-clad type, made of the finest quality of laminated Swedish iron.

The ventilation is effected by the use of specially constructed vanes, forming air ducts between the laminæ, and creating a very strong current of air throughout the windings.

The commutators are very large and made out of pure copper.

The brush-holders are of a special design, constructed so that the brushes can be removed without disturbing the tension of the spring.

They are also lined with copper strips which act as springs, holding the brushes in firm contact with the holders.

The armature shaft bearing has a phosphor-bronze sleeve with ring oilers and oil reservoir.

The field is of the best quality steel casting. The field coils are form-wound, separate and interchangeable; covered with rubber tape, and baked.

The machines are compound wound, with the series coils entirely independent of the shunt coils. Will stand 25 per cent. overload without over heating.

Capacity, Number of 16 C. P. Lamps	Size of Engine	Speed, R. P. M.	OUTSIDE DIMENSIONS			Weight, Lbs.	List Price
			Height to Top of Engine, Inches	Length, Inches	Width, Inches		
30	4 x 3	550	32	36	19	725	\$ 412.50
50	5 x 4	525	38	36	20	860	495.00
100	6 x 5	425	48	55	25	1600	660.00
150	7 x 5	375	68	69	30	2300	907.50
200	8 x 6	325	68	72	31	2800	1072.50

Prices include lubricator, rheostat and wrenches.

INCANDESCENT LAMPS

STANDARD LAMPS

Regular Type

Candle-Power	Voltage	Standard Pkg.	Price Each
2-4-8	130	....	\$0.20
16-24	130	....	.20
32	130	100	.30

Mill Type

Double anchored filament; especially adapted for Mills, Boats, Factories, etc.

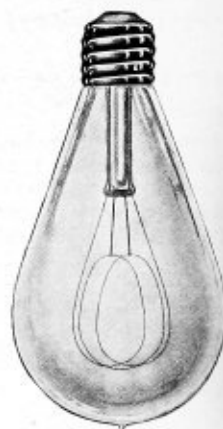
Candle-Power	Voltage	Standard Pkg.	Price Each
16	100-130	250	\$0.20
16	200-260	250	.22
32	200-260	100	.40

TANTALUM LAMPS

Candle-Power	Watts	Voltage	Standard Pkg.	Price Each
12½	25	100-130	100	\$0.50
20	40	100-130	100	.50
40	80	100-130	50	.85

TUNGSTEN LAMPS

Candle-Power	Watts	Voltage	Standard Pkg.	Price Each
20	25	100-125	100	\$0.80
32	40	100-125	100	.90
48	60	100-125	50	1.25
80	100	100-125	24	1.60



W. E. DIRECT CURRENT ENCLOSED ARC LAMPS

Type 650, Marine Style, Especially Suitable for
Contractors, Dredgemen, Etc.



Terminal Volts	110
Arc Volts	80
Amperes	5
Upper Carbons	½x12 in.
Lower Carbons	½x¼ in.
Length	26 in.
Case, Black Enameled	Steel
Weight	32 lbs.
Price	\$40.00

Equipped with clear inner and outer globes and wire guards; no reflector.

Can be adjusted by means of a rheostat to operate on circuits ranging from 110 to 125 volts.

The 5 amp. 110 volt lamps, with ½ inch carbons will burn approximately 160 to 180 hours.

ELECTRICAL MATERIAL

Rubber Covered Wires—National Electrical Code Standard
SINGLE CONDUCTOR—SOLID

B. & S. Size	BASIS FOR PRICE PER 1,000 FEET											Add for Each Extra Braid
	11	12	13	14	15	16	17	18	19	20	21	
0000	371.00	385.00	398.00	411.00	425.00	438.00	451.00	465.00	478.00	491.00	505.00	25.00
000	312.00	323.00	334.00	344.00	355.00	365.00	376.00	387.00	397.00	408.00	418.00	23.00
00	261.00	270.00	278.00	287.00	295.00	303.00	312.00	320.00	329.00	337.00	345.00	21.00
0	187.00	194.00	200.00	207.00	213.00	219.00	226.00	232.00	239.00	245.00	251.00	19.00
1	147.00	152.00	158.00	163.00	168.00	173.00	178.00	183.00	188.00	193.00	198.00	17.00
2	109.00	113.00	117.00	122.00	126.00	130.00	134.00	138.00	142.00	146.00	150.00	13.00
3	91.00	94.50	98.00	101.00	104.00	107.00	110.00	114.00	117.00	120.00	123.00	12.00
4	75.80	78.30	80.80	83.40	85.80	88.40	91.00	93.40	96.00	98.50	101.00	11.00
5	65.40	67.40	69.40	71.40	73.40	75.40	77.40	79.40	81.40	83.40	85.40	10.00
6	55.80	57.40	59.00	60.50	62.10	63.70	65.30	66.90	68.40	70.00	71.60	9.00
8	35.60	36.60	37.60	38.60	39.60	40.60	41.60	42.60	43.60	44.60	45.60	8.00
9	31.00	31.80	32.60	33.40	34.20	34.90	35.70	36.50	37.30	38.00	38.80	7.50
10	26.60	27.30	27.90	28.50	29.20	29.80	30.40	31.10	31.70	32.40	33.00	7.00
12	20.40	20.80	21.20	21.60	22.00	22.40	22.80	23.20	23.60	24.00	24.40	6.00
14	16.30	16.60	16.80	17.00	17.30	17.50	17.80	18.00	18.30	18.50	18.80	5.00
16	13.2	13.4	13.5	13.7	13.8	14.0	14.2	14.3	14.5	14.6	14.8	4.0
18	11.5	11.6	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	3.8
19	10.6	10.7	10.8	10.9	10.9	11.0	11.1	11.2	11.2	11.3	11.4	3.6
20	9.7	9.8	9.8	9.9	10.0	10.0	10.1	10.1	10.2	10.3	10.3	3.4
22	8.8	8.9	8.9	8.9	9.0	9.0	9.0	9.1	9.1	9.1	9.2	3.2

Prices for wires No. 0 and larger are for single or double braid; all others are for single braid only.

FLEXIBLE INCANDESCENT LAMP CORD

For Drop Lights, Brackets, Portables, Etc.

New Code, 1-32 Rubber—Cotton Covered

Composed of fine copper wires, wound with cotton, insulated with a light coating of seamless rubber and braided in cotton.

Number	22	20	18	16	14	12	10
Price per 1,000 feet.....	\$18.30	\$21.80	\$25.30	\$32.00	\$47.50	\$73.30	\$112.30

PORCELAIN TUBES

Tube dimensions conform to the rules of the Underwriters' Board.

Price Per 100

Length, inches Under Head	$\frac{1}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{3}{16}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{1}{4}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{5}{16}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{3}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{1}{2}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{5}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{3}{4}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$\frac{7}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$1\frac{1}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$1\frac{1}{4}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$1\frac{3}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$1\frac{1}{2}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$1\frac{7}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$2\frac{1}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$2\frac{1}{4}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$2\frac{3}{8}$ " Hole, $\frac{1}{8}$ " Outside Diameter	$2\frac{1}{2}$ " Hole, $\frac{1}{8}$ " Outside Diameter
2½	\$1.44	\$1.56	\$2.30	\$2.54	\$3.36	\$4.98	\$12.26	\$15.60	\$19.85	\$23.45	\$26.80	\$30.35	\$33.55	\$36.55	\$39.55	\$42.55	\$45.55	\$48.55
3	1.55	1.82	2.56	2.80	3.62	5.24	13.80	17.40	22.05	25.85	29.60	32.55	35.30	38.05	40.80	43.55	46.30	49.05
4	1.70	1.97	2.80	3.44	3.90	6.52	15.60	19.20	23.05	27.70	31.50	35.30	39.05	42.80	46.55	50.30	54.05	57.80
5	3.06	3.60	4.22	5.10	5.60	8.28	18.10	25.30	34.15	41.70	48.85	56.80	64.65	72.50	80.35	88.20	96.05	103.90
6	3.90	4.68	5.44	6.22	7.00	9.34	19.20	31.20	45.35	57.95	70.55	83.20	95.80	108.40	121.00	133.60	146.20	158.80
8	7.20	8.40	9.60	10.80	12.00	16.80	24.00	38.40	58.10	73.90	89.80	105.60	121.40	137.20	153.00	168.80	184.60	200.40
10	9.60	10.80	12.00	14.40	16.80	19.20	31.20	45.60	66.00	81.80	97.70	113.50	129.30	145.10	160.90	176.70	192.50	208.30
12	14.40	15.60	16.80	19.20	21.60	26.40	45.60	69.20	102.10	128.00	154.00	180.00	206.00	232.00	258.00	284.00	310.00	336.00
14	16.80	19.20	21.60	24.00	26.40	28.80	52.80	81.60	121.40	153.10	184.80	216.50	248.20	279.90	311.60	343.30	375.00	406.70
16	19.20	21.60	24.00	28.80	31.20	36.00	62.40	91.20	132.00	163.70	195.40	227.10	258.80	290.50	322.20	353.90	385.60	417.30
18	21.60	24.00	28.80	33.60	36.00	40.80	72.00	102.20	158.60	195.10	231.40	267.70	304.00	340.30	376.60	412.90	449.20	485.50
20	24.00	26.40	31.20	36.00	38.40	45.60	79.20	112.80	176.15	216.00	256.30	296.60	336.90	377.20	417.50	457.80	498.10	538.40
22	27.60	30.00	33.60	38.40	43.20	49.20	86.40	123.60	192.95	237.60	282.20	326.90	371.60	416.30	461.00	505.70	550.40	595.10
24	31.20	33.60	36.00	40.80	48.00	52.80	93.60	134.40	210.20	259.20	308.20	357.10	406.00	454.90	503.80	552.70	601.60	650.50

FLEXDUCT AND CIRCULAR LOOM



Hole	$\frac{1}{4}$ inches.	Per foot	Price
22	$\frac{3}{8}$	22	\$.06
22	$\frac{1}{2}$	22	.07
22	$\frac{5}{8}$	22	.08
22	$\frac{3}{4}$	22	.10
22	$\frac{7}{8}$	22	.12
22	1	22	.16
22	1 $\frac{1}{4}$	22	.20

PORCELAIN KNOBS

For supporting single conductors, each knob being formed with slots to accommodate any one of four sizes of wire.

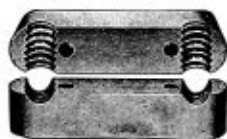
No. 9419.	Complete knob for wire up to $\frac{3}{8}$ " diameter (500 in package).....	\$20.00 per 1000
No. 9420.	" " " " " "	35.00 "
No. 9421.	" " " " " "	12.00 "
No. 9417 and 9420 hold wire 1 inch from wall.		

B. AND D. ONE-WIRE CLEATS

Bases are full one inch from wire to bottom of cleat.



No.	Size R. C. Wire, B. & S.	Size Hole	Price per 1,000
345	14 to 6	$\frac{1}{8}$ to $\frac{3}{8}$ inch	\$ 26.88
346	10 to 2	$\frac{3}{16}$ to $\frac{1}{2}$ inch	40.00
347	2 to 0	$\frac{1}{2}$ to 1 inch	48.00
348	0 to 00	$\frac{3}{4}$ to $\frac{3}{8}$ inch	60.00
349	000 to 200,000 C. M.	$\frac{1}{2}$ to $\frac{3}{4}$ inch	80.00
350	200,000 C. M. to 500,000 C. M.	$\frac{3}{4}$ to 1 inch	120.00
351	500,000 C. M. to 1,000,000 C. M.	1 to $1\frac{1}{8}$ inch	160.00
352	1,000,000 C. M. to 2,000,000 C. M.	$1\frac{1}{8}$ to $1\frac{1}{2}$ inch	400.00



STANDARD TWO AND THREE-WIRE CLEATS

Height 1½, width 5⁄8, length 3¼, groove ⅜ inches. Standard package, 1,000.

	Glazed	Unglazed
Two-wire, per 1,000.....	No. 3909 \$20.00	No. 3931 \$16.00
Three-wire, per 1,000.....	No. 3933 10.20	No. 3934 16.00

EDISON PLUG CUT-OUTS



Plug Cut-Outs

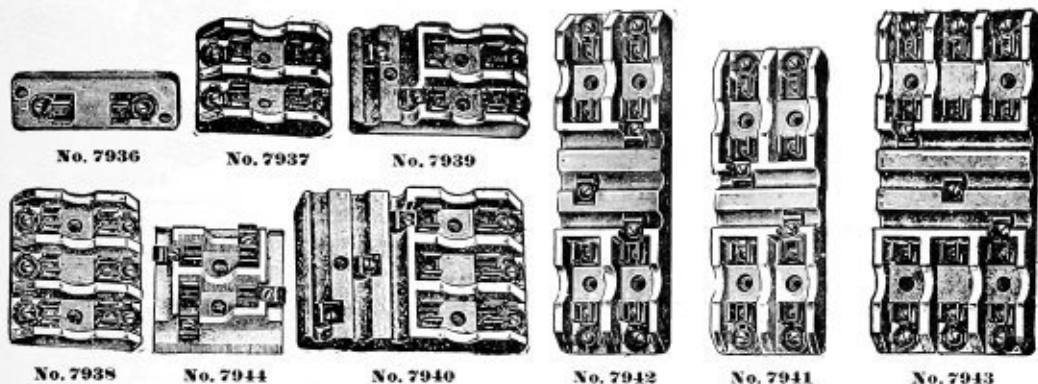
List No.		Std. Pkg.	Price
62135	3 Wire, Double Branch.....	50	\$0.80
8042	3 Wire, Single Branch.....	75	.....
62587	D. P. Double Branch.....	100	52
62588	D. P. Double Branch.....	100	48
62165	3 Wire Main.....	100	41
61935	D. P. Single Branch.....	100	32
62965	Double Pole Main.....	150	29
8020	Double Pole Main.....	150	18
8020	D. P. Single or Double Branch.....	150	36

Fuse Plugs for Use with Plug Cut-Outs

List No.	Amp.	Std. Pkg.	Price
66327	3	500	\$0.00
66329	6	500	.00
66331	10	500	.00
66333	12	500	.00
66335	15	500	.00
66337	20	500	.00
66339	25	500	.00
66341	30	500	.00

ENCLOSED FUSE CUT-OUTS

National Electric Code Standard 30 Ampere, 250 Volts



PRICES ENCLOSED FUSE CUT-OUTS

FUSES FOR ABOVE CUT-OUTS
Length Over All 2 in., Diameter Tube $\frac{1}{2}$ in.

List No.	Style	Std. Pkg.	Price Each	List No.	Ampere Capacity	Std. Pkg.	Price
7936	Single Pole, Main Line.....	50	\$0.40	34949	3	100	\$0.25
7937	Two Wire, Main Line.....	50	.55	34950	5	100	.25
7938	Three Wire, Main Line.....	50	.80	34951	8	100	.25
7939	Two Wire, Single Branch.....	50	.70	34952	10	100	.25
7940	Three Wire, Single Branch.....	50	1.35	34953	12	100	.25
7941	Two Wire, Double Branch.....	25	1.30	34954	15	100	.25
7942	Three to Two Wire, Double Branch	25	1.50	34955	20	100	.25
7943	Three Wire, Double Branch.....	25	2.25	34956	25	100	.25
7944	Two Wire, Cross Over.....	50	.65	34957	30	100	.25

SOCKETS AND RECEPTACLES

Edison Screw Base



No.	Style	Std. Pkg.	Price Each
9184	Key Receptacle with Porcelain Base.....	250	\$0.44
9366	Porcelain Weatherproof Socket.....	250	.25
9386	Key Socket, Fibre Lined, $\frac{1}{8}$ -inch Pipe.....	500	.33
9407	Weatherproof Receptacle, Side Wires.....	100	.40
9448	Weatherproof Bracket Socket, Porcelain for $\frac{1}{8}$ -inch Pipe.....	100	.60
35000	H. G. Pull Socket for $\frac{1}{8}$ -inch Pipe.....	250	.60
43310	Moulded Mica Weatherproof Socket.....	250	.36
50745	Keyless Receptacle, Fibre Lined with removable Ring and Porcelain Base	250	.30

MESCO CURRENT TAP

Combined Socket and Attaching Plug

For tapping and carrying the current from any electric light fixture to motor, drop lights, etc., without the loss of lamp already in fixture.

Body may be left in socket while connections may be made or broken without disturbing the light.

Of glazed porcelain with bronze contact tips.

For 250 Volts		Price
List No.	Mesco Current Tap, Multiple.....	\$0.50
16415	" " Series.....	.50

Separable Attachment Plugs

Separates at any angle without strain on cord or socket.

List No.		Price
16416	Porcelain Cap, 3 Amp. 250 V. Std. Pkg.	each \$0.25
16417	Rubber " " " "	250, " .30

List No. 16414



No. 16410

PONY ROSETTES

List No.		Price
6565	Clear Rosette Fusible.....	\$0.16
6566	Moulding " ".....	.16
6567	Concealed " ".....	.16
16445	Clear " ".....	.14
16446	Moulding " ".....	.14
16447	Concealed " ".....	.14



SEPARABLE WIRELESS CLUSTER

Type 5K

List No.		Put up One in a Box	Std. Pkg.	Price
53K		3-Light	10	\$1.85
54K		4 " "	10	2.10
55K		5 " "	10	2.35
56K		6 " "	10	2.60
57K		7 " "	10	2.85



Type 5K Multiple

WIRELESS CLUSTERS COMPLETE

These pendant clusters are made up from cluster bodies and consist of cluster body, 12-inch stem, crowfoot, shade holder and canopy, complete with shade, but not wired.

Edison Base, Multiple, with Style 8 Bodies

List No.		Price
14770	2-Light with 12-inch flat Opal Shade..	\$2.40
14771	2-Light with 12-inch flat X-Ray Shade	3.60
14772	2-Light with 12-inch flat Aluminum Shade.....	2.90
14773	2-Light with 12-inch flat Mirror Shade	2.80
14774	2-Light with 12-inch flat Tin Shade...	2.10



WIRE LAMP GUARDS

Illustrations show a few leaders in our line of Lamp Guards. All are standard weight and for 16 C. P. Lamps.



No. 11074 No. 14730

No. 11068 No. 14733

List No.		Price
11074	Per	
14730	Doz.	\$2.40
11068	Per	
14733	Doz.	1.20
14733	Per	
14733	Doz.	3.00

SOCKET PLUGS

Rubberite, 3/8 inch, 28-thread for 1/8-inch pipe.

No. 9165—Per 100.....	\$0.90
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SOLDERING STICKS

9910	Solderene.....	\$0.20
9911	Victor Soldering Stick.....	.24
9912	Crescent " ".....	.24
4782	Allen " ".....	.24
4782	Dozen lots.....	.20

CLOTH BASE RUBBER INSULATING TAPES

List No.		Price Per lb.
4740	Manhattan, White, 1/4 lb. Rolls.....	\$0.60
4741	Manhattan, Black, 1/4 " ".....	.50
4742	Manhattan, White, 1/2 " ".....	.50
4743	Manhattan, Black, 1/2 " ".....	.50
4744	Grimshaw, White, 1/2 " ".....	1.20
4745	Grimshaw, Black, 1/2 " ".....	1.40
4746	Manson, Black, 1/2 " ".....	1.10
4747	Okonite, Black, 1/2 " ".....	1.70
4748	Kerite, Black, 1 " ".....	1.60
4749	Competition, Black, 1/2 " ".....	.80
4754	Competition, White, 1/2 " ".....	.80
4750	P. & B., Black, 1/2 " ".....	1.00
4751	Acme, Black, 1/2 " ".....	1.00

Special Quantity Prices.

RUBBER GUM TAPE

List No.		Price
4752	Manhattan A, 1/2 lb. Rolls, per lb.....	\$1.00
4753	Manhattan B, 1/2 " ".....	.70

Any of the above Tapes furnished in 1/2, 1, 1 1/2, 2 and 3 inches wide, to order.

RED SEAL DRY BATTERY

Voltage, 1.5
Amperage, About 20



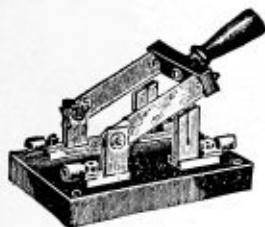
Has a medium internal resistance, sufficient for lasting qualities when not doing service.

Gives excellent results for gas engine ignition.

No.		Each
2445 A,	2 1/2 x 6 1/2.....	\$0.20
" 2446 B,	3 x 7 1/2.....	.35
" 2447 C,	3 1/2 x 8 1/2.....	.45

TYPE "H" SWITCHES

Conforms with rules of Nat. Board of Fire Underwriters



Unpolished

Made single, double or triple pole, single or double throw, single break with or without fuse terminals, for front connections with lugs for soldering wires.

Price Each. 300 Volt. Without Fuse Connection

List No.	Amp.	S. P. S. T.	S. P. D. T.	D. P. S. T.	D. P. D. T.	Pt. S. T.	3 Pt. D. T.
11745	35	\$2.00	\$3.00	\$3.00	\$4.50	\$4.50	\$6.75
11746	50	2.65	4.00	4.00	6.00	6.00	9.00
11747	75	3.35	5.00	5.00	7.50	7.50	11.25
11748	100	4.00	6.00	6.00	9.00	9.00	13.50
11749	200	5.35	8.00	8.00	12.00	12.00	18.00
11750	300	6.65	10.00	10.00	15.00	15.00	22.50
11751	400	8.45	12.65	12.65	19.00	19.00	28.50
11752	500	10.00	15.00	15.00	22.50	22.50	33.75
11753	600	11.10	16.80	16.80	25.00	25.00	37.50
11754	800	15.60	23.40	23.40	35.00	35.00	52.50
11755	1000	22.25	33.40	33.40	50.00	50.00	75.00

PORCELAIN BASE SWITCHES

National Electrical Code Standard

125 VOLT, SINGLE POLE

List No.	Std. Pkg.	Price
7097 15 Amp. S. P. S. T.	100	\$0.34
7098 25 " " " " S. T.	100	.44
7099 15 " " " " D. T.	100	.60
7100 25 " " " " D. T.	100	.74

125 VOLT, DOUBLE POLE

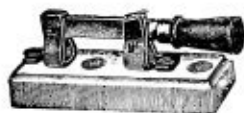
List No.	Std. Pkg.	Price
7101 15 Amp. D. P. S. T.	250	\$0.42
7102 25 " " " " S. T.	250	.50
7103 15 " " " " D. T.	100	.74
7104 25 " " " " D. T.	100	.90

250 VOLT, SINGLE POLE

List No.	Std. Pkg.	Price
11734 16 Amp. S. P. S. T.	100	\$0.40
11735 25 " " " " S. T.	100	.50
11736 15 " " " " D. T.	100	.68
11737 25 " " " " D. T.	100	.84

250 VOLT, DOUBLE POLE

List No.	Std. Pkg.	Price
11738 15 Amp. D. P. S. T.	250	\$0.5
11739 25 " " " " S. T.	250	.6
11740 15 " " " " D. T.	100	.8
11741 25 " " " " D. T.	100	1.0



STANDARD 250 VOLT SNAP SWITCHES

Number	2000—5 Amps.	S. P. slotted.	Std. Pkg.	Price Each
"	2047—5	" " Ind.	250	\$0.24
"	2001—10	" " " "	250	.28
"	2048—5	" " " "	100	.32
"	2009—10	" " " "	100	.36
"	2038—10	" " D. P. Concealed	100	.66
"		" " " "	100	.66



SWITCH BOARDS

Furnished to suit requirements of purchaser and made to conform with rules of the National Board of Fire Underwriters, of any size and capacity for any arrangement of generators and circuit, constructed of plain, enameled or marbleized slate, Vermont, Tennessee, or Italian Marble.

USUAL EQUIPMENT

- 1 Voltmeter.
- 1 Ammeter.
- 1 Pilot Light.
- 1 Ground Detector and Voltmeter Switch.
- 1 Plug Cut-out on rear.
- 1 two P., S. T., fused Main Switch with N. E. C. Fuses on rear of board.

- 1 Set of N. E. C. Enclosed fuses.
- 1 Angle Iron Frame.
- Necessary connections on rear of board.
- Rheostat Drilling, if templet is furnished, no rheostat included in price.

MOUNTING: 1 1/4-inch Black Enameled Slate.

FINISH: All Metal Parts polished and lacquered.

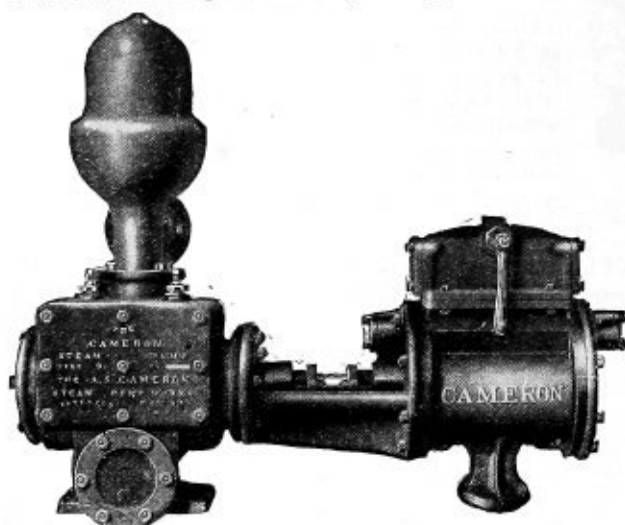
CIRCUIT BREAKERS can be furnished if so ordered, at additional prices.

Be sure to state number of machines to be used, voltage and amperage of each, number of circuits leaving the board, capacity of each, how machines are to be connected, choice of instruments, etc.



"CAMERON" REGULAR PATTERN STEAM PUMP FOR GENERAL SERVICE

We Are Western Agents and Carry a Large Stock in Chicago



The first seven sizes furnished with hand lever attachment when so desired. Sizes 0 to 4A are made same as cut of boiler feed pattern shown on next page, other sizes as shown in illustration above, except sizes 11 and larger, which have a series of valves.

Code Word*	Size Number	Price with Iron Water Cylinder and Steel Piston Rod	Price with Water Cylinder Lining, Piston and Piston Rod of Composition	Diameter of Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity per Stroke, Gallons	Ordinary Speed per Minute in Strokes	Capacity at Ordinary Speed per Minute, Gallons	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Floor Space, Inches	Weight
Aba.	0	\$ 80.00	\$ 85.00	3 1/4	2	4	.054	150	8	2 1/2	1 1/2	1 1/4	1	32 x 9	136
Abaco.	1	120.00	125.00	4	2 1/2	6	.081	150	12	3 1/2	2 1/2	1 3/4	1	40 x 10	210
Abalak.	2	140.00	150.00	5	3	6	.12	150	18	4 1/2	3 1/2	2 1/4	1 1/4	40 x 11	254
Abbadia.	3	165.00	175.00	6	3 1/2	7	.21	133	28	5 1/2	4 1/2	3 1/4	1 3/4	47 x 13	418
Abbeville.	3a	185.00	200.00	6	3 1/2	7	.29	133	38	6 1/2	5 1/2	4 1/4	2 1/4	47 x 15	435
Abbot.	4	210.00	225.00	7	4	7	.29	133	48	7 1/2	6 1/2	5 1/4	2 1/4	47 x 15	459
Abenberg.	4a	235.00	250.00	7	4	7	.39	133	50	8 1/2	7 1/2	6 1/4	2 1/4	51 x 16	457
Abertord.	5	275.00	290.00	7	3 1/2	12	.5	100	60	1	1 1/2	1 1/4	2 1/4	58 x 17	620
Aberlady.	5b	325.00	350.00	7	5	13	1.10	90	100	1	1 3/4	1 3/4	3	63 x 20	1,117
Abita.	6	325.00	340.00	8	4	12	.65	100	65	1	1 1/2	1 1/4	3	58 x 18	864
Abrego.	6a	350.00	375.00	8	5	13	1.10	90	100	1	1 3/4	1 3/4	4	63 x 20	1,160
Abries.	7	375.00	400.00	10	5	13	1.10	90	100	1 1/4	2	2	4	64 x 21	1,345
Abriola.	8	400.00	425.00	10	6	13	1.59	90	150	1 1/4	2	4	4	64 x 21	1,411
Abruzzi.	9	470.00	520.00	12	7	13	2.16	90	200	1 1/2	2 1/4	5	4	66 x 24	1,928
Abukir.	10a	540.00	575.00	14	8	13	2.83	90	261	2	3	5	5	73 x 26	2,548
Abury.	10	600.00	675.00	14	9	18	4.96	67	330	2	3	6	6	81 x 30	3,126
Abusabel.	11	725.00	800.00	16	10 1/2	18	6.75	67	450	2 1/2	4	8	8	90 x 37	4,827
Abydos.	13	900.00	1,000.00	18	12	20	9.80	60	587	3	4	10	8	103 x 41	6,360

*If the above code words are used, be sure to add the word "Cameron" to message. If pump with iron water cylinder and steel piston rod is desired, add the word "ironcl." If pump with water cylinder lining, piston and piston rod of composition is desired, add the word "Compocil."

Note.—Discount changes on sizes larger than No. 10a.

Send for our complete catalog of Pumps.

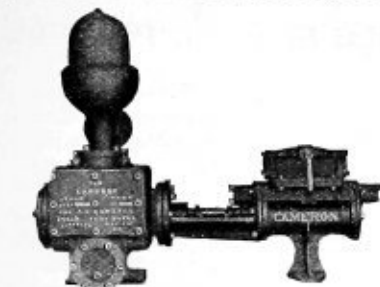
For Tables and Useful Information see back part of this book.

"CAMERON" STEAM PUMPS

REGULAR BOILER FEED PATTERN

Give quantity of feed water required; a pump which will supply this quantity at about one-half its rated capacity at ordinary speed will be right for cold water, and say one-third speed for hot water.

In feeding hot water the pump should be placed below the source of supply. The first six sizes furnished with hand-lever attachment when so desired.



Code Word	Size Number	Price with Iron Water Cylinder and Steel Piston Rod	Price with Water Cylinder Lining Piston and Piston Rod of Composition	Diameter of Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity at Ordinary Speed per Minute, Gallons	Boilers, in Horse-power, they will supply at 1/2 Ordinary Speed, not over 30 lbs. per sq. in. Water per Horse-power per Hour	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Floor Space, Inches	Weight
Acadia.....	0	\$ 80.00	\$ 85.00	3 1/2	12	4	8	40	3/4	3/8	1 1/4	1	32 x 9	136
Acampo.....	1	120.00	125.00	4	12	6	12	60	1	3/8	1 1/4	1 1/4	40 x 10	210
Acari.....	2	140.00	150.00	5	12 1/2	6	18	90	1 1/2	3/4	1 1/2	1 1/4	40 x 11	254
Acacus.....	2a	150.00	165.00	5	13	7	28	140	1 3/4	3/4	1 1/2	1 1/4	47 x 12	347
Acebo.....	2b	160.00	170.00	5	13 1/2	7	38	190	1 3/4	3/4	2 1/4	2 1/4	47 x 14	355
Achim.....	3a	210.00	225.00	6	14	7	50	250	1	1	2 1/4	2 1/4	47 x 14	422
Achomry.....	3c	210.00	225.00	6	14 1/2	12	50	250	1 1/2	1	2 1/4	2 1/4	58 x 17	520
Ackley.....	3d	230.00	245.00	6	15	12	65	325	1 1/2	1	3	2 1/4	58 x 17	525
Accores.....	5a	280.00	310.00	7	16	12	80	400	1 1/2	1	3	3	58 x 18	725
Acorn.....	5b	325.00	350.00	7	17	13	100	500	1	1 1/2	4	3	63 x 20	1,117
Aequaro.....		375.00	400.00	8	18	13	150	750	1	1 1/2	4	3 1/2	64 x 21	1,202
Aera.....		425.00	465.00	9	19	13	200	1,000	1	1 1/2	5	4	66 x 24	1,680
Aeritas.....		445.00	490.00	10	20	13	200	1,000	1 1/4	2	5	4	66 x 24	1,770
Acton.....		500.00	530.00	12	24	13	261	1,300	1 1/2	2 1/2	5	5	73 x 26	2,010

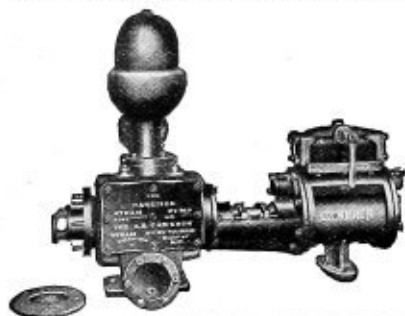


CAMERON REGULAR LIGHT SERVICE PUMP

This pump is adapted for filling tanks, irrigating and light duty generally, on railways, in factories, and for situations where a considerable quantity of water is to be lifted to a limited elevation. It is not designed for mining work, nor to force water against heavy lifts. In light service duty, the pressure on the valves being low, the pump can therefore be run faster, thus obtaining a greater capacity than given in list.

Code Word	Price with Iron Water Cylinder and Steel Piston Rod	Price with Water Cylinder Lining Piston and Piston Rod of Composition	Diameter of Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity per Stroke, Gallons	Capacity at Ordinary Speed per Minute, Gallons	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Weight
Alabaster.....	\$140.00	\$150.00	4	3	7	.21	28	3/8	1/8	2	1 1/4	835
Alabat.....	150.00	160.00	4	3 1/4	7	.29	38	3/8	1/8	2 1/4	1 1/4	846
Aladan.....	160.00	170.00	5	3 1/2	7	.39	50	3/8	1/8	2 1/4	1 1/4	858
Alagon.....	160.00	170.00	5	4	7	.39	50	3/8	1/8	2 1/4	1 1/4	845
Alameda.....	170.00	180.00	5	4 1/4	7	.39	50	3/8	1/8	2 1/4	1 1/4	860
Alamo.....	210.00	225.00	6	5	7	.60	80	3/8	1/8	3	1 1/4	553
Alaqua.....	230.00	250.00	6	5 1/2	7	.60	80	3/8	1/8	3	1 1/4	628
Alba.....	275.00	300.00	6	6	7	.86	115	3/8	1/8	4	1 1/4	800
Alberona.....	285.00	310.00	6	6 1/2	7	.86	115	3/8	1/8	4	1 1/4	824
Alberton.....	380.00	435.00	7	7	13	2.16	200	1	1 1/2	5	4	1,540
Albiano.....	400.00	450.00	8	7	13	2.16	200	1	1 1/2	5	4	1,575
Albidona.....	425.00	465.00	9	7	13	2.16	200	1	1 1/2	5	4	1,680
Albizzate.....	445.00	490.00	10	7	13	2.16	200	1 1/4	1 1/2	5	5	1,800
Albondon.....	410.00	450.00	9	8	13	2.83	261	1	1 1/2	5	5	1,630
Alcaraz.....	420.00	460.00	9	8	13	2.83	261	1	1 1/2	5	5	1,660
Alcudia.....	480.00	530.00	9	9	13	3.53	330	1	1 1/2	5	5	2,050

THE CAMERON STEAM PUMP—REMOVABLE BUSHING PATTERN

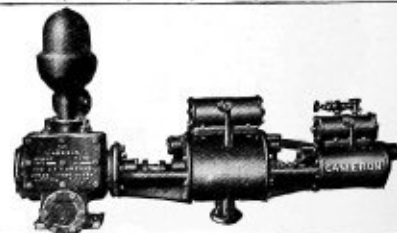


Where mine water is very gritty and the use of a plunger pump is prohibited on account of limited space or other circumstances, to secure the greatest durability possible with a piston pump, we supply a removable bushing of iron or composition. This bushing can be turned in the pump so that the wear, which is usually greatest on the bottom, can be gradually distributed over every portion of its surface. Furthermore, if, from the deepening of the mine, it becomes necessary for the pump to be placed lower, the removable bushing can be replaced by one of smaller diameter, thus changing the proportions of the pump, and enabling it, within certain limits, to work against a greater head.

Size Number	Price with Iron Bushing and Steel Piston Rod	Price, with Bushing, Piston and Piston Rod of Composition	Diameter of Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity per Stroke in Gallons	Ordinary Speed per Minute, in Strokes	Capacity at Ordinary Speed per Minute in Gallons	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Weight
0	\$ 85.00	\$ 90.00	3 $\frac{1}{2}$	2	4	.054	150	12	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	135
2	130.00	135.00	4	2 $\frac{1}{2}$	6	.081	150	12	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	210
3	150.00	155.00	5	3	6	.12	150	12	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	254
3a	175.00	185.00	6	3 $\frac{1}{2}$	7	.21	133	28	1 $\frac{1}{2}$	1	2	1 $\frac{1}{2}$	418
4	230.00	215.00	6	3 $\frac{1}{2}$	7	.29	133	38	1 $\frac{1}{2}$	1	2	1 $\frac{1}{2}$	435
4a	225.00	240.00	7	3 $\frac{1}{2}$	7	.29	133	38	1 $\frac{1}{2}$	1	2	1 $\frac{1}{2}$	459
5	250.00	265.00	7	4	7	.39	133	50	1 $\frac{1}{2}$	1	2	1 $\frac{1}{2}$	457
5b	290.00	305.00	7	3 $\frac{1}{2}$	12	.5	100	50	1	1 $\frac{1}{2}$	3	2 $\frac{1}{2}$	820
6	350.00	375.00	8	5	13	1.10	90	100	1	1 $\frac{1}{2}$	4	3	1,117
6a	340.00	355.00	8	4	12	.65	100	65	1	1 $\frac{1}{2}$	3	2 $\frac{1}{2}$	864
7	375.00	400.00	8	5	13	1.10	90	100	1	1 $\frac{1}{2}$	4	3	1,160
7a	400.00	425.00	10	5	13	1.10	90	100	1 $\frac{1}{2}$	1	4	3	1,345
8	430.00	455.00	10	6	13	1.58	90	150	1 $\frac{1}{2}$	1	4	3	1,411
9	500.00	550.00	12	7	13	1.16	90	200	1 $\frac{1}{2}$	1	5	4	1,928
10a	575.00	610.00	14	8	13	2.83	90	261	2	2	5	5	2,548

THE CAMERON SINGLE COMPOUND PUMP

The whole steam valve movement is actually more positive than in a simple pump, since the high pressure, steam-chest plunger is freer to move, and that of the low pressure cylinder has an almost irresistible force acting on it at the moment of reversal.

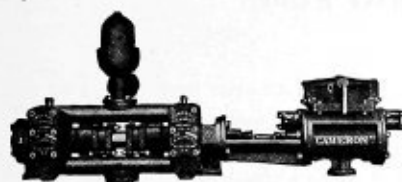


Code Word	Price with Iron Bushing and Steel Piston Rod	Price with Water Cylinder Lining, Piston and Piston Rod of Composition	Diameter of Steam Cylinder, Inches	Diameter of Low Pressure Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity per Stroke, Gallons	Capacity at Ordinary Speed per Minute, Gallons	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Weight
Atacama	7	12	5	13	1.10	100	1	2 $\frac{1}{2}$	4	3	2,350
Ataki	7	12	5 $\frac{1}{2}$	13	1.33	125	1	3 $\frac{1}{2}$	4	3 $\frac{1}{2}$	2,350
Atalissa	8	14	6	13	1.59	150	1	3 $\frac{1}{2}$	4	4	2,880
Atarfe	8	14	6 $\frac{1}{2}$	13	1.87	180	1	4	5	4	3,000
Atascosa	9	16	6 $\frac{1}{2}$	18	2.59	180	1	3	5	4	3,700
Atax	10	12	7	13	2.16	200	1	2 $\frac{1}{2}$	5	4	2,400
Atarra	10	14	7	18	3.00	200	1 $\frac{1}{2}$	4	5	4	4,700
Atcham	9	16	7 $\frac{1}{2}$	18	3.44	230	1 $\frac{1}{2}$	4	5	5	4,400
Atieta	8	14	8	13	2.83	260	1	3	5	5	3,100
Aterno	10	18	8	18	3.90	260	1 $\frac{1}{2}$	4	6	5	5,200
Ateste	12	22	8	20	4.35	260	1 $\frac{1}{2}$	5	6	5	6,900
Atbani	9	16	9	18	4.96	330	1	4	6	5	4,300
Atbelney	12	22	9 $\frac{1}{2}$	20	6.13	370	1 $\frac{1}{2}$	5	6	5	6,900
Atbens	7	12	10	13	4.12	400	1	2 $\frac{1}{2}$	6	5	2,800
Atherton	10	18	10	18	6.12	400	1 $\frac{1}{2}$	4	6	5	5,400

If above code words are used be sure to add the word "Cameron"

For Tables and Useful Information see back part of this book.

THE CAMERON OUTSIDE PACKED PLUNGER PUMP — REGULAR PATTERN



This pump is especially adapted for station duty in mines, and is far more durable than a piston pump for handling gritty water.

There are no wearing parts in the water end except the packing in the stuffing-boxes, which can be instantly tightened up from the outside. Since the plunger works in loose sleeves, the pump barrel cannot be cut or worn by grit or sand, and the stuffing-boxes are placed in the center, so that there is no tendency for the plunger to sag. It is more compact than any other make of plunger pump, and has no outside rods or crossheads. It is also adapted for feeding boilers under heavy pressure.

Code Word	Size	Price, with Iron Plunger and Steel Piston Rod	Price, with Composition Plunger and Piston Rod	Diameter of Steam Cylinder, Inches	Diameter of Plunger, Inches	Stroke of Piston, Inches	Capacity of Ordinary Speed per Minute, Gallons	Boilers, in Horse Power they will Supply at $\frac{1}{2}$ Ordinary Speed, Based on 30 Lbs. of Water per Horse Power per Hour	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Floor Space, Inches	Weight
Basal.....	A	\$125.00	\$150.00	4	2	6	12	60	$\frac{3}{4}$	$\frac{1}{2}$	$1\frac{1}{4}$	1	53 x 10	283
Bababan.....	B	220.00	250.00	5	3	7	28	140	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	59 x 13	551
Babek.....	B-B	270.00	300.00	7	$3\frac{1}{4}$	7	38	190	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	60 x 15	600
Babla.....	C	325.00	375.00	7	$3\frac{1}{4}$	12	50	250	1	$1\frac{1}{2}$	3	$2\frac{1}{2}$	82 x 18	1,200
Bacalar.....	C	375.00	425.00	8	4	12	65	325	$1\frac{1}{2}$	$1\frac{1}{2}$	3	$2\frac{1}{2}$	82 x 18	1,291
Bachmut.....	D	475.00	550.00	10	5	13	100	500	$1\frac{1}{2}$	$2\frac{1}{2}$	4	$3\frac{1}{2}$	91 x 23	1,937
Backbone.....	E	515.00	600.00	12	5	13	100	500	$1\frac{1}{2}$	$2\frac{1}{2}$	4	$3\frac{1}{2}$	91 x 25	2,173
Bacoli.....	E	625.00	750.00	12	6	18	150	750	$1\frac{1}{2}$	$2\frac{1}{2}$	5	$4\frac{1}{2}$	114 x 25	2,995
Bacup.....		700.00	825.00	14	6	18	150	750	2	$3\frac{1}{2}$	5	$4\frac{1}{2}$	126 x 27	3,517
Badaos.....		750.00	925.00	16	6	18	150	750	$2\frac{1}{2}$	$4\frac{1}{2}$	5	$4\frac{1}{2}$	130 x 28	4,000
Badoor.....		585.00	650.00	10	7	13	200	1,000	$1\frac{1}{2}$	$2\frac{1}{2}$	4	$4\frac{1}{2}$	99 x 26	2,575
Baerum.....	E-E	625.00	700.00	12	7	13	200	1,000	$1\frac{1}{2}$	$2\frac{1}{2}$	4	$4\frac{1}{2}$	99 x 27	2,735
Batra.....		650.00	750.00	12	7	13	200	1,000	$1\frac{1}{2}$	$2\frac{1}{2}$	4	$4\frac{1}{2}$	114 x 27	2,970
Baganpa.....		675.00	775.00	14	7	13	200	1,000	2	$3\frac{1}{2}$	5	$4\frac{1}{2}$	103 x 27	3,135
Bagnasco.....		700.00	800.00	14	7	18	200	1,000	2	$3\frac{1}{2}$	5	$4\frac{1}{2}$	126 x 28	3,372

THE CAMERON VERTICAL BOILER FEED PUMP

The cut shows a plain unassuming vertical piston pump on base, but where it is known its virtues are appreciated, since it possesses every necessary attribute of a perfect direct-acting pump, and occupying but little space. Although shown on a base plate, it is sometimes preferred to bolt the pump, by means of lugs cast on the back, to the bulkhead. This was done in the case of a pump of this type furnished to a gunboat, which has seen quite active service in the U. S. Navy. In common with all Cameron pumps, no working part is exposed except a small part of the rod, which may also be covered if necessary.

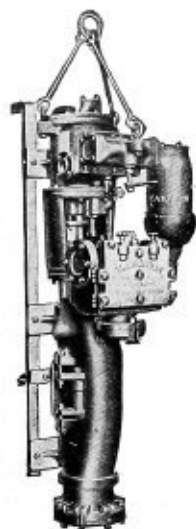
The steam end may be adapted to work under any steam pressure, no matter how high, and the water end is fitted with our patent priming valves, and a removable bushing which may be taken out and replaced with a new one in a few minutes, thus avoiding any delay when it becomes necessary to renew the working barrel of the cylinder on account of wear.



Code Word	Price, with Removable Piston Rod	Price, with Removable Piston Rod and Composition	Diameter of Steam Cylinder, Inches	Diameter of Water Cylinder, Inches	Stroke of Piston, Inches	Capacity at Ordinary Speed per Minute	Boilers, in Horse Power they will Supply at $\frac{1}{2}$ Ordinary Speed, Based on 30 Lbs. of Water per Horse Power per Hour	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Weight
Drabund.....	\$105.00	\$110.00	$3\frac{1}{2}$	2	4	8	40	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	1	200
Dracut.....	155.00	160.00	4	2	6	12	60	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	1	300
Dragonera.....	180.00	190.00	5	$2\frac{1}{2}$	6	18	90	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	380
Dragonl.....	200.00	210.00	5	3	7	28	140	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	520
Dragonr.....	210.00	220.00	5	$3\frac{1}{4}$	7	38	190	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	540
Dragten.....	265.00	280.00	6	4	7	50	250	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	630

If above code words are used, add the word "Cameron."
For Tables and Useful Information see back part of this book.

THE CAMERON STANDARD VERTICAL PLUNGER MINE SINKING PUMP



This is the most successful sinking pump that has ever been placed on the market. Any steam pump that is to be used in sinking a mine shaft must be strong, certain in operation, capable of handling gritty water, require little attention, and above all, be able to stand the roughest kind of usage without sustaining injury.

The CAMERON sinking pump has no outside valve gear, arms or levers to be bent or broken off. It cannot suffer from violent collision with the walls of the mine shaft, and is not likely to receive injury from the explosion of blasts.

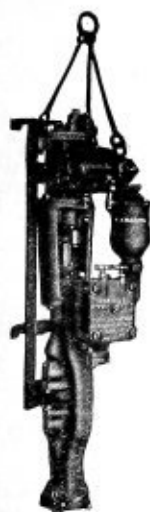
Being fitted with our exhaust cut-off, it will run along as fast as steam will drive it with an irregular or intermittent supply of water, or when the water fails entirely, not only without danger of the piston striking the heads, but without injury to the valves.

Code Word	Size Number	Price, with Iron Plunger and Steel Piston Rod	Diameter of Steam Cylinder, Inches	Diameter of Plunger, Inches	Stroke of Piston, Inches	Capacity per Stroke, Gallons	Capacity at Ordinary Speed per Minute, Gallons	Steam Pipe	Exhaust Pipe	Section Pipe	Discharge Pipe	Space Occupied in Shaft, Inches	Weight
Cabaca.....	5	\$ 350.00	7	3½	12	.5	50	1	1½	2½	2	24 x 24	1,285
Cabanes.....	6	400.00	8	4	12	.65	65	1	1½	3	2½	25 x 25	1,335
Cabazon.....	7	500.00	10	5	13	1.10	100	1¼	2	4	3	31 x 30	2,180
Cabellio.....		575.00	12	5	13	1.10	100	1½	2½	4	3	32 x 33	2,595
Cabira.....	8	525.00	10	6	13	1.58	150	1¼	2	4	3½	31 x 31	2,230
Cabra.....	9a	575.00	12	6	13	1.58	150	1½	2½	4	3½	32 x 33	2,475
Cachias.....		675.00	14	6	13	1.58	150	2	3	4	3½	40 x 35	3,336
Cadalen.....	9	625.00	12	7	13	2.16	200	1½	2½	5	4	34 x 33	3,088
Cadenet.....	9b	675.00	14	7	13	2.16	200	2	3	5	4	40 x 35	3,435
Cadillac.....		750.00	16	7	16	2.66	200	2½	4	5	4	42 x 40	4,500
Cadotte.....	10	725.00	14	8	13	2.83	261	2	3	5	5	40 x 38	3,888
Caffa.....	11	800.00	16	8	16	3.48	261	2½	4	5	5	42 x 40	4,606
Cagli.....		900.00	16	9	16	4.40	330	2½	4	6	5	42 x 45	5,163
Caguan.....	12	1,000.00	18	9	16	4.40	330	3	4	6	5	42 x 45	5,522
Caicos.....		1,200.00	16	10½	16	6.0	450	2½	4	8	6	.....	6,000
Caipha.....		1,300.00	18	10½	16	6.0	450	3	4	8	6	.....	6,200
Caistor.....		1,700.00	18	12	16	7.83	587	3	4	10	8	.....	7,200
Calaf.....		1,800.00	20	12	16	7.83	587	4	5	10	8	.....	7,700
Calamo.....		1,900.00	22	12	16	7.83	587	4	5	10	8	.....	8,300
Calbe.....		2,000.00	24	12	16	7.83	587	4	5	10	8	.....	9,000

If above code words are used, be sure and add the word "Cameron."

For Tables and Useful Information see back part of this book.

CAMERON VERTICAL SINKING PUMPS

Prospectors'
SinkerContractors'
Differential PlungerRegular
Differential Plunger

PROSPECTORS' SINKING PUMP

Diameter of steam cylinder 6 inches, diameter of plunger 3 inches, stroke of piston 7 inches, capacity .21 gallon per stroke, or 28 gallons per minute at ordinary speed, steam $\frac{3}{4}$, exhaust 1 inch, suction 2 inches, discharge $1\frac{1}{2}$ inches, space occupied in shaft 27x21 inches, weight 685 pounds. Price, with iron plunger and steel piston rod, \$250.00.

CONTRACTORS' DIFFERENTIAL PLUNGER PUMP

Diameter of steam cylinder 6 inches, diameter of upper plunger 4, lower plunger 6 inches, stroke of piston 7 inches, capacity per stroke .39 gallon, per minute 50 gallons at ordinary speed, steam $\frac{3}{4}$, exhaust 1 inch, suction 3, discharge $2\frac{1}{2}$ inches, weight 475 pounds. Price, with iron plunger and steel piston rod, \$225.00.

REGULAR DIFFERENTIAL PLUNGER SINKING PUMP

Originally designed for a light machine, discharging a considerable quantity of water to a limited elevation.

For this work it is particularly well adapted, as the water flows in a steady current in one direction, and is not retarded by its passage through the valves, which have large interstices.

Code Word	Price, with Iron Plunger and Steel Piston Rod	Diameter of Steam Cylinder, Inches	Diameter of Upper Plunger, Inches	Diameter of Lower Plunger, Inches	Stroke of Piston, Inches	Capacity per Stroke, Gallons	Capacity at Ordinary Speed per Min., Gal.	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Discharge Pipe, Inches	Weight, Lbs.
Chickamas	\$350.00	7	3 $\frac{1}{2}$	5	12	.65	50	1	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2	1,000
Clanton	400.00	8	4	6	12	.65	65	1	1 $\frac{1}{2}$	3	2 $\frac{1}{2}$	1,100
Claquato	500.00	10	5	7	13	1.10	100	1 $\frac{1}{2}$	2	4	3	1,500
Clarina	550.00	12	5	7	13	1.10	100	1 $\frac{1}{2}$	2 $\frac{1}{2}$	4	3	1,900
Clausthal	575.00	10	6	8	13	1.58	150	1 $\frac{1}{2}$	2	4	3 $\frac{1}{2}$	2,000
Clecy	625.00	12	6	8	13	1.58	150	1 $\frac{1}{2}$	2 $\frac{1}{2}$	4	3 $\frac{1}{2}$	2,200
Clements	675.00	14	6	8	13	1.58	150	2	3	4	3 $\frac{1}{2}$	2,400
Cleona	675.00	12	7	9	13	2.16	200	1 $\frac{1}{2}$	2 $\frac{1}{2}$	5	4	2,800
Clerff	725.00	14	7	9	13	2.16	200	2	3	5	4	3,000
Clifton	775.00	16	7	9	16	2.66	200	2 $\frac{1}{2}$	4	5	4	3,500
Climax	775.00	14	8	12	13	2.83	261	2	3	5	5	3,900
Chola	825.00	16	8	12	16	3.48	261	2 $\frac{1}{2}$	4	5	5	4,400
Chummo	900.00	16	9	13	16	4.40	330	2 $\frac{1}{2}$	4	6	5	5,000
Clonmel	1,100.00	16	10	14	16	5.44	400	2 $\frac{1}{2}$	4	10	8	6,000
Clontarf	1,450.00	18	12	17	16	7.83	587	3	4	10	8	6,300

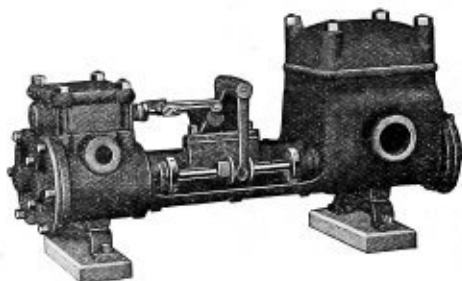
If above code words are used, be sure and mention the word "Cameron."

For Tables and Useful Information see back part of this book.

THE DEANE (of Holyoke)

Duplex Boiler Feed or Pressure Pump—Piston Pattern

For Feeding Boilers
Under Pressures of
150 Lbs. or Less



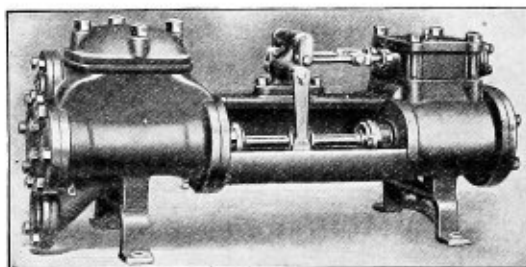
For General Service will
stand a Constant Water
Pressure of 200 Lbs.

Water End with Removable Heads, Cap and Valve Plate; Pistons are Fibrous Packed and the Valves are of Rubber or Metal to Suit Requirements

SIZES			Capacity gallons per minute	Horse Power Boilers Will Feed	PIPE SIZES				Floor Space, Inches	Weight Lbs.	List Regular Fitted	List Brass Fitted
Diam. Steam Cyls.	Diam. Water Cyls.	Length of Stroke			Steam	Exhaust	Suction	Dis- charge				
3	2	3	8 to 20	70 H. P.	$\frac{3}{8}$	$\frac{1}{2}$	$1\frac{1}{4}$	1	24x10	200	\$ 55.00	\$ 60.00
$4\frac{1}{2}$	$2\frac{1}{4}$	4	20 " 40	170 "	$\frac{1}{2}$	$\frac{3}{4}$	2	2	33x13	320	90.00	102.00
$5\frac{1}{4}$	$3\frac{1}{2}$	5	41 " 88	280 "	$\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	38x16	435	120.00	136.00
6	4	6	65 " 98	470 "	1	$1\frac{1}{2}$	3	3	43x17	565	140.00	160.00
$7\frac{1}{2}$	5	6	102 " 153	670 "	$1\frac{1}{4}$	$1\frac{1}{2}$	4	3	48x21	850	195.00	227.00
$7\frac{1}{2}$	$4\frac{1}{2}$	10	103 " 172	800 "	$1\frac{1}{4}$	$1\frac{1}{2}$	4	3	59x21	970	275.00	331.00
9	$5\frac{1}{4}$	10	141 " 234	1000 "	$1\frac{1}{2}$	2	4	3	60x23	1000	325.00	403.00
10	6	10	193 " 305	1400 "	$1\frac{1}{2}$	2	5	4	61x26	1500	440.00	525.00

THE WORTHINGTON DUPLEX BOILER FEED PUMP

Piston Pattern for
150 Lbs. Pressure.
Valve-Motion
Drop-Forged Steel



Packed Water Pistons
Operating in Brass-
Lined Cylinders

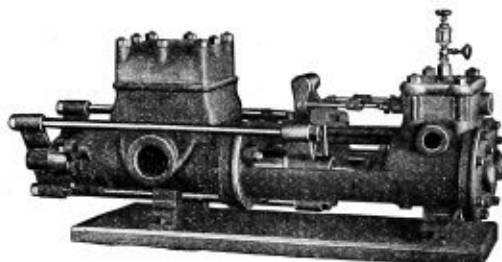
SIZES			Horse-Power of Boiler will Feed based on 45 lbs. Water per hour and Slow Speed	PIPE SIZES				Floor Space Inches	Weight Lbs.	List Regular Fitted	List Brass Fitted
Diam. Steam Cyls.	Diam. Water Cyls.	Length of Stroke		Steam	Exhaust	Suction	Discharge				
3	2	3	70	$\frac{3}{8}$	$\frac{1}{2}$	$1\frac{1}{4}$	1	$23\frac{1}{2} \times 8\frac{1}{4}$	100	\$ 55.00	\$ 57.00
$3\frac{1}{2}$	$2\frac{1}{4}$	4	110	$\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$27\frac{1}{2} \times 9$	165	75.00	78.00
$4\frac{1}{2}$	$2\frac{1}{4}$	4	170	$\frac{1}{2}$	$\frac{3}{4}$	2	$1\frac{1}{4}$	$32\frac{1}{2} \times 12\frac{1}{2}$	260	90.00	94.00
$5\frac{1}{4}$	$3\frac{1}{2}$	5	280	$\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$38 \times 15\frac{1}{2}$	425	120.00	126.50
6	4	6	470	1	$1\frac{1}{4}$	3	2	$43 \times 16\frac{1}{2}$	540	140.00	151.00
$7\frac{1}{2}$	5	6	670	$1\frac{1}{2}$	2	4	3	$45 \times 21\frac{1}{4}$	780	195.00	206.00
$7\frac{1}{2}$	$4\frac{1}{2}$	10	800	$1\frac{1}{2}$	2	4	3	59×22	1000	275.00	305.00
9	$5\frac{1}{4}$	10	1000	2	$2\frac{1}{2}$	5	4	60×23	1500	325.00	355.00
10	6	10	1400	2	$2\frac{1}{2}$	6	5	68×29	2600	400.00	430.50

For Tables and Useful Information see back part of this book.

THE DEANE OUTSIDE PACKED DOUBLE PLUNGER PUMP

For Boiler Feeding and General Service

Good for Working Water

Pressures up to and
including 250 Lbs.For Gritty or Muddy
Water

Recommended for Boiler Feeding or other Service where the Water Pressure is over 125 Lbs. or where the water is Gritty or Muddy. Has many Advantages over the Piston Pattern.

All Packing is Free of Access and Easily Cared for and Adjusted.

SIZE			Capacity Gallons Per Minute	BOILER FEED			PIPE SIZES				Floor Space, Inches
Diam. Steel Cyls.	Diam. Water Cyls.	Length of Stroke		Strokes per Minute	Gallons per Minute	Boiler H. P.	Steam	Exhaust	Suction	Discharge	
4½	2	4	10 to 15	66	7.2	95	½	¾	2	1½	49x13
4½	2½	4	20 to 30	66	13.6	180	½	¾	2	1½	49x13
5½	3½	5	41 to 62	58	24.0	310	¾	1¼	2½	1½	58x16
6	4	6	49 to 81	52	34	445	1	1½	3	2	61x17
7½	4½	6	62 to 103	52	43	560	1½	2	4	3	68x21
7½	5	6	76 to 127	52	53	700	1½	2	4	3	68x21
7½	4½	12	83 to 166	38	63	825	1½	2	4	3	104x21
7½	5	12	102 to 204	38	77	1000	1½	2	4	3	104x21
9	5½	12	112 to 224	38	85	1100	2	2½	5	4	106x26
10	6	12	147 to 294	38	111	1460	2	2½	5	4	106x26
12	7	12	200 to 400	38	152	2000	2½	3	6	5	118x32
14	8½	12	295 to 590	38	224	3000	2½	3	6	5	120x35
16	10½	12	450 to 900	38	341	4500	2½	3	8	7	123x41

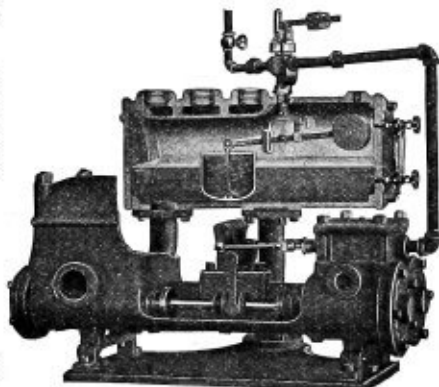
THE DEANE AUTOMATIC DUPLEX FEED PUMP AND RECEIVER

This apparatus is designed to automatically drain heating systems and machines or appliances used in manufacturing which depend upon free circulation of steam for their efficiency. It furthermore is arranged to automatically pump the water of condensation drained from such systems back to the boilers without loss of heat.

By this operation it serves a double purpose: first to automatically relieve the system of the water of condensation constantly collecting therein, thus insuring a free and unobstructed circulation, and incidentally, preventing snapping and hammering in the piping, which in many cases is due to entrained water, and second, to automatically deliver this water, which in many cases is at the boiling point, directly to the boilers without the intervention of tanks or other devices commonly used. Not only does it relieve the system of a troublesome factor, but it introduces a supply of feed water to the boiler at a temperature impossible otherwise without the use of a special water heater.

SIZE			Square feet of Radiating Surface* Drained per Minute	PIPE SIZES				Number of Inlets on Receiver
Diam. of Steel Cyl.	Diam. of Water Cyl.	Length of Stroke		Steam	Exhaust	Receiver Inlet	Dis- charge	
3	2	3	5,000	½	½	2½	1	3
4½	2½	4	10,000	½	¾	2½	1½	3
5½	3½	5	20,000	¾	1¼	2½	1½	3
6	4	6	40,000	¾	1½	2½	2	3
7½	5	6	50,000	1	2	2½	3	3
7½	4½	12	55,000	1	2	2½	3	3
9	5½	12	70,000	1½	2½	2½	3	3
10	6	12	85,000	1½	2½	2½	4	3

* 1,000 square feet of radiating surface equal about 3,000 linear feet of one-inch pipe.



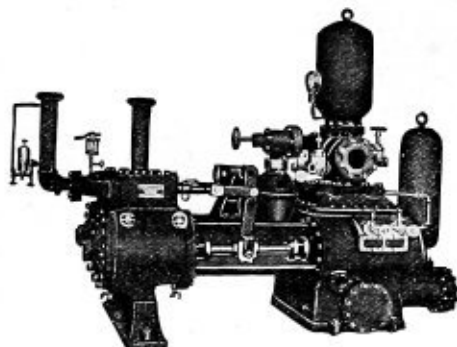
For Tables and Useful Information see back part of this book.

DUPLEX UNDERWRITER FIRE PUMPS

Built in Strict Accordance with Latest Specifications of the Associated Factory Mutual Fire Insurance Companies

The following necessary fittings, otherwise charged for as extras, are included in the price and regularly furnished as a part of this pump:

A capacity plate with directions for operating; a stroke gauge, indicating the length of stroke the pump is making; a vacuum chamber; a water relief valve or safety valve of large capacity; a cast iron discharge cone for relief valve; two best quality pressure gauges; a set of brass priming pipes and special priming valves; from two to six hose valves; a sight feed steam cylinder lubricator.



18x10x12 Underwriter Fire Pump.

Underwriter Rating, Gallons per Minute	No. of Standard Fire Streams, each 250 Gallons per Minute	Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Price, each
359	1	12	6	12	2½	3	6	5	\$ 750.00
522	2	14	7	12	3	4	8	6	900.00
807	3	16	9	12	3½	4	10	7	1,125.00
1,004	4	18	10	12	4	5	12	8	1,350.00
1,655	6	20	12	16	5	6	14	10	2,250.00

"REILLY" STEAM BREWERY PUMPS

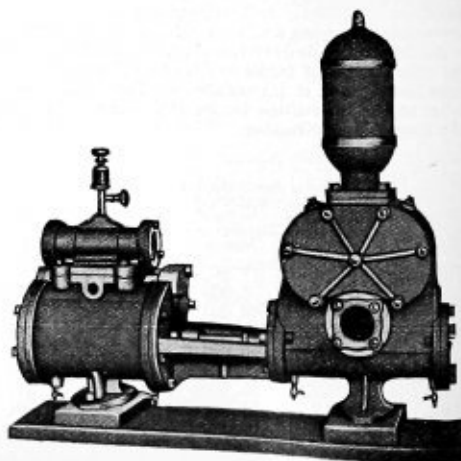
These pumps are especially designed for pumping hot or cold beer, mash, etc. They have special hinged valves, or vertical lifting valves with large openings, allowing free passage of solid materials, and preventing clogging. The removal of one cover plate gives access to all the valves, facilitating examination and cleaning.

Brass lining, stuffing-boxes, valves and valve seats and Tobin bronze piston rod with each pump.

Brass pump piston at small additional cost.

Pump ends can also be furnished of solid bronze, when so desired.

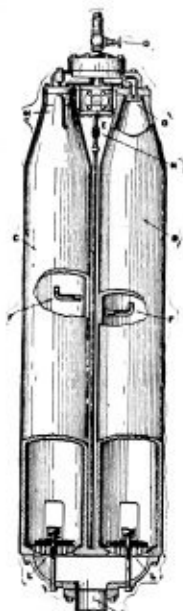
Steam Cylinder	Water Cylinder	Stroke	Gals. per Stroke	Capacity per Minute		Steam Pipe	Exhaust Pipe	Suction Pipe	Delivery Pipe	Price, each
				Strokes	Gallons					
4	2½	7	.12	125	15	½	¾	1½	1	\$ 60.00
5	3½	7	.25	125	31	¾	1	2	1½	115.00
5	4	7	.38	125	47	¾	1	2½	2	120.00
6	4	10	.55	100	55	1	1¼	2½	2	175.00
6	5	10	.85	100	85	1	1¼	3½	3	180.00
7	4	10	.55	100	55	1	1¼	2½	2	195.00
7	5	10	.85	100	85	1	1¼	3½	3	200.00
7	6	10	1.22	100	122	1	1¼	4	3½	210.00
8	5	14	1.19	80	95	1¼	1½	3½	3	240.00
8	6	14	1.71	80	137	1¼	1½	4	3½	260.00
8	7	14	2.33	80	186	1¼	1½	5	4	280.00
10	7	14	2.33	80	186	1½	2	5	4	300.00
10	8	14	3.04	80	243	1½	2	6	5	350.00
12	8	14	3.04	80	243	2	2½	6	5	375.00
12	10	14	4.76	80	380	2	2½	8	7	400.00
14	10	14	4.76	80	380	2	2½	8	7	450.00
14	12	20	9.79	60	587	2	2½	10	8	600.00
16	14	20	13.32	60	800	2½	3	10	8	750.00



THE "EMERSON" STEAM VACUUM PUMPS



Front View



Sectional View



Emerson Junior

Double Cylinder—Sizes Nos. 1 to 7

Single Cylinder Sizes A and B

The water is forced from the cylinder to a height corresponding with the boiler pressure available, by the direct pressure of steam, then the steam (which others exhaust into the atmosphere) is condensed to form a vacuum and cause the cylinder to fill again. There are no pistons or plungers of any kind in the cylinders or that come in contact with the water being pumped. There is no friction nor is there anything in the chambers to break or wear out, the work being done solely by the direct pressure of steam and by the vacuum produced by the condensation of the steam after it has been used once for expelling the water.

Does not require priming.

Noiseless in operation.

No adjustment to make.

Air in suction pipe does not stop it.

Will work as well suspended on the end of cable as on a fixed foundation.

No exhaust pipe required, as the steam is used twice. Pumps sandy and muddy water.

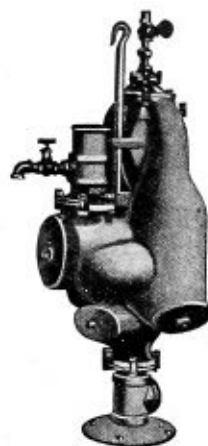
Double Cylinder Emerson Pumps

No.	List Price	Weight, Lbs.	Capacity, Gallons per Minute	Cylinders		Steam Pipe	Suction, Inches	Discharge, Inches
				Diam., Inches	Length, Feet			
1	\$ 343.75	950	225	6	6	$\frac{3}{4}$	3	$2\frac{1}{2}$
2	437.50	1375	415	8	$6\frac{1}{2}$	1	4	3
3	625.00	1900	725	10	7	$1\frac{1}{4}$	5	4
4	875.00	3100	1200	12	8	$1\frac{1}{2}$	6	5
5	1437.50	4400	2100	16	8	2	8	6
6	2125.00	5400	3275	20	8	$2\frac{1}{2}$	10	8

Single Cylinder Emerson "Junior" Pumps

Size	Steam Pipe, Inches	Suction, Inches	Discharge, Inches	Gallons per Minute	Weight, Lbs.	Price of Pump
A	$\frac{1}{2}$	3	$2\frac{1}{2}$	100	219	\$125.00
B	$\frac{3}{4}$	4	3	180	290	175.00

Capacities given for 20 ft. head—Capacity varies with steam pressure and lift.

"PULSOMETER" STEAM PUMP

It is entirely automatic in action, requires no foundation or special skill to operate. It requires no oil and has very little mechanism subject to derangement. It will stand the roughest kind of usage and is ready for operation when the steam is turned on.

No.	SIZE OF PIPES, INCHES			CAPACITY IN GALLONS PER MINUTE AT DIFFERENT ELEVATIONS WITH BOILER POWER AND STEAM PRESSURE USUALLY PROVIDED (APPROXIMATE)				DIMENSIONS AND WEIGHTS			NET PRICES	
	Steam Fitted for	Suction Fitted for	Discharge Fitted for	25 Feet	50 Feet	75 Feet	H. P. Required	Height, Inches	Floor Space, Inches	Wgt., Lbs.	Flat Valve	Ball Valve
2	1/4	1 1/2	1 1/2	20	17	13	4	25	14x13	95	\$ 90.00	\$95.00
3	3/8	2	2	60	50	38	5	27	17x14	140	120.00	127.50
4	1/2	2 1/2	2 1/2	100	80	65	6	33	19x19	295	180.00	190.00
5	1 1/2	3	3	180	160	115	9	38	21x22	430	210.00	220.00
6	3/4	3 1/2	3 1/2	300	265	200	12	43	23x24	570	270.00	295.00
7	3/4	4	4	425	375	275	15	49	25x26	745	330.00	360.00
8	1	5	5	700	625	450	25	61	32x33	1,375	480.00	530.00
9	1 1/2	7	6	1,000	900	650	35	72	38x36	2,100	600.00	660.00
10	2	8	8	2,000	1,800	1,400	70	88	52x45	3,800	1,200.00	.....

The price includes suitable strainer, either basket or mushroom, steam controlling globe valve with nipple and union and relief valve. The capacities given are estimated from results obtained in actual practice. Flat Valve Pumps are used for all general purposes. Ball Valve Pumps are used only for pumping liquids containing foreign matter, as waste of breweries, slaughter houses, pulp in paper mills, tan liquors, etc.

"NYE" IMPROVED STEAM PUMP

It is simple in construction, having no bored out cylinders with accurately fitting pistons to be packed. It is impossible for sand, grit, or mud to affect its working.

There is no loss of power in overcoming friction and momentum, as there is no intermediate machinery between power and effect, the steam acting directly upon the fluid to be moved, without the intervention of a piston. The formation of a vacuum by condensing the exhaust steam, and the movement of all the valves is perfectly automatic, and made at no expense of power.



No.	Capacity in Gallons of Each Cylinder	Size of Steam Pipe	Size of Suction Pipe	Size of Discharge Pipe	Weight	GALLONS PER MINUTE, AT AN ELEVATION OF		Price, Each
						25 Feet	50 Feet	
1	4	1/2	2	1 1/2	500	80	40	\$ 150.00
2	8	3/4	3	2	850	200	100	225.00
3	16	1	4	3	1,100	300	200	300.00
4	25	1 1/4	5	4	1,600	500	400	400.00
5	37 1/2	1 1/2	6	5	2,300	800	600	500.00
6	50	2	7	6	2,800	1,000	800	600.00
7	140	2 1/2	10	8	3,500	2,000	1,500	800.00
8	200	3	11	10	4,300	3,000	2,000	1,000.00

The above capacity is estimated on a total height of 25 feet, with 40 lbs. steam pressure at the pump. A deduction must be proportionately made on higher elevations; also greater or less quantity, according to pressure of steam. Foot valves included. Catalogue on application.

HUMPHRYES HYDRAULIC RAM



No.	Quantity of Water Furnished Per Minute by the Fountain to which Ram is Adapted	Length of Drive Pipe	Size of Pipes		Weight	Price Each
			Drive	Discharge		
2	2 Qts. to 2 Galls.	25 to 50 feet	$\frac{3}{4}$ In.	$\frac{3}{8}$ In.	24 lbs.	\$ 9.00
3	1 1/2 Galls. to 4 "	25 to 50 "	1 "	$\frac{1}{2}$ "	33 "	11.00
4	3 " to 7 "	25 to 50 "	1 1/4 "	$\frac{3}{4}$ "	48 "	14.00
5	6 " to 14 "	25 to 50 "	1 1/2 "	1 "	67 "	22.00
6	11 " to 25 "	25 to 50 "	2 "	1 1/4 "	94 "	40.00
7	20 " to 40 "	25 to 50 "	2 1/2 "	1 3/4 "	222 "	75.00
8	25 " to 75 "	25 to 50 "	3 "	2 "	456 "	125.00



THE NIAGARA HYDRAULIC ENGINE

The Niagara engine represents the most modern development of the hydraulic ram. It is the latest adaptation of the principles of hydraulics and is capable of being utilized for purposes entirely beyond the possibilities of the ordinary ram. Its action is absolutely reliable and constant; the running expenses are nominal as the only working parts are two rubber disc valves.

It will automatically elevate water 35 feet high for each foot fall, giving a constant supply and keeping a continuous circulation of fresh water in a tank.

No. of Engine	Diameter of Drive Pipe, Inches	Diameter of Delivery Pipe, Inches	Flow of Spring or Stream, Gallons, Required per Minute	Minimum Fall in Feet	Maximum Fall in Feet	Will Elevate Water Each Foot Fall	Limit of Lift, Capacity in Feet	Weight, Crated, lbs.	Height, Inches	Length, Inches	Width, Inches	Price, Each	
												Single Acting	Double Acting
0								74	17	13 1/2	7 3/4	\$ 45.00	
1	1	1 1/4	2 to 4	11	40	35	400	190	23 3/4	19 1/2	11 1/4	60.00	75.00
1 1/2	1 1/2	1 1/2	" " 18	13	40	35	400	232	32 3/4	22 3/4	14	70.00	80.00
2	2	2 1/2	" " 25	15	40	35	400	400	42 3/4	24 3/4	15	75.00	100.00
3	3	3 1/2	" " 40	17 1/2	40	35	400	500	52 3/4	28	16 1/2	90.00	110.00
4	4	4 1/2	" " 75	19 1/2	40	35	300	779	66	34 3/4	20	190.00	210.00
5	5	5 1/2	" " 100	20	30	30	300	1,355	59 1/2	49	30	375.00	415.00
6	6	6 1/2	" " 150	21 1/2	30	30	150	2,990	108	78	42	625.00	675.00
12	12	12	" " 400	22 1/2	20	20	150	4,100	120	96	52	1,000.00	1,075.00

For railroad purposes the Nos. 8 and 12 machines are most popular.

DIRECTIONS FOR ORDERING

When ordering make a careful survey and send us the following information, that we may determine what size engine is required:

1. The flow of water, in gallons, per minute.
 2. Number of feet fall from source of supply to proposed location of engine.
 3. The distance from source of supply to proposed location of engine.
 4. Vertical height above engine to which water is to be elevated.
 5. The distance from proposed location of engine to point of delivery.
 6. Quantity of water, in gallons, required per day.
- In ordering double-acting engines, give sketch showing full details of situation, capacity of spring, in gallons, per minute, number of feet fall from spring to proposed location of engines, etc.

STEAM SYPHON PUMPS

The Syphon is the simplest apparatus made for raising fluids by steam. It has no piston, no valves, no moving parts whatever. It is operated entirely by the direct action of steam; to set it, it is only necessary to attach the steam suction and discharge pipes; to start it, means only the opening of the steam valve.

The Syphon offers an unobstructed passage to the liquid pumped, and will pump anything smaller than the pipes; ashes, chips, rags, or other refuse do not choke it but are pumped through with the water.

Height—The Syphon will raise water about one foot for each pound pressure of steam at the pump. If the fluid is heavier than water, this estimate must be reduced.

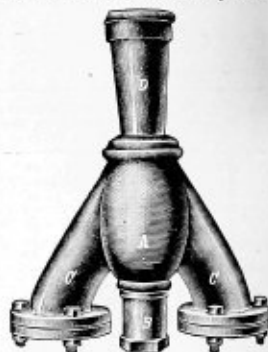
Capacity—As given, is based upon 60 lbs. steam pressure at the pump and 15 feet lift. With a greater lift or less steam, these capacities will be reduced.

Temperature—The Syphon can be used for pumping warm liquors but not too hot. About 140° Fahr. is the limit. It will not pump boiling water, nor will it force water into a boiler like an injector.

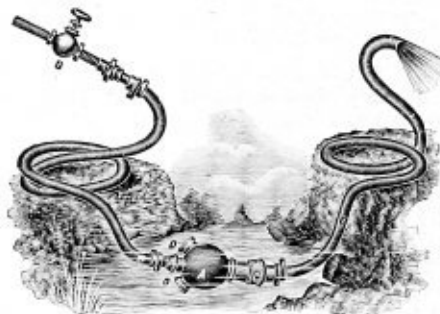
The Pump is shown in cut; suction pipes are attached at CC; steam pipe at B, and discharge pipe at D; steam is turned on through the steam pipe B, and rushes across the globular chamber A into D, carrying the air in A and D before it, thereby exhausting the air from A. Water to supply its place rises through the suction pipes CC from atmospheric pressure, as in ordinary suction pumps, when the steam jet forces it onward through D, with a velocity proportioned to the steam pressure applied to the pump.

No.	Capacity Gallons per Minute	Diameter Discharge	Diameter Steam Pipe	Price of High Pressure Pump only, for Steam Pressure of 30 lbs. or Over
3	30	$\frac{3}{4}$	$\frac{1}{2}$	\$16.00
4	50	1	$\frac{3}{4}$	20.00
5	120	$1\frac{1}{2}$	1	35.00
6	200	2	$1\frac{1}{4}$	45.00
7	320	$2\frac{1}{2}$	$1\frac{1}{2}$	70.00
8	450	3	$1\frac{1}{2}$	90.00

Sizes 7 and 8 have flanged suctions, balance screw connections.



PORTABLE RAILWAY SYPHON



Complete with hose and fittings for supplying construction engines with water and for supplying locomotive tenders from any body of water within reach, near the side of the road. No. 1 will supply the ordinary quantity of water required by a tender in 10 to 12 minutes; No. 2, in 6 to 8 minutes. Capacity, No. 1, 120 gals.; No. 2, 200 gals. per minute, with 60 lbs. steam pressure and 15-ft. vertical lift.

No.	Price each
No. 1 Outfit, without hose.....	\$ 40.00
No. 1 Outfit, with 25 feet each of steam and discharge hose.....	110.00
No. 1 Outfit, with 50 feet each of steam and discharge hose.....	165.00
No. 2 Outfit, without hose.....	50.00
No. 2 Outfit, with 25 feet each of steam and discharge hose.....	145.00
No. 2 Outfit, with 50 feet each of steam and discharge hose.....	200.00

THE ALDRICH VERTICAL TRIPLEX ELECTRIC PUMP

SOLID WATER END PATTERN

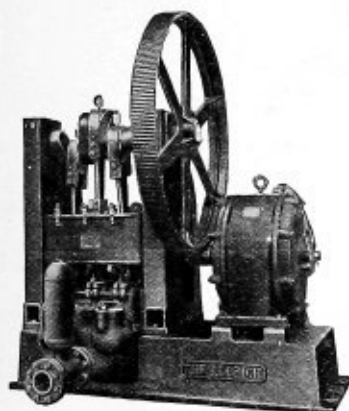


Fig. 125

Latest and best design—heavily proportioned. Direct waterways with no reverse in flow from suction to discharge. Slow velocity of water through pump (approx. 3 feet per second) saving friction loss. Large bearings adjustable for wear, valves completely accessible through individual covers. Bronze valve seats and springs, rubber or leather valves with heavy bronze backing. Gear and pinion are heavy cast iron machine cut. Fittings: Air and vacuum chambers packing, wrenches and oil or grease cups as desired. For special fittings see next page—belted pumps.

Data Required for Quotation

- 1st. Maximum and normal amount of water per minute.
- 2nd. Total height of discharge.
- 3rd. Character of water.
- 4th. If direct current motors, give voltage; if alternating, give voltage, number of cycles or alternations, phase, capacity and make of generator.
- 5th. Speed and size driving pulleys.

Maximum Capacity in U. S. Gallons per Minute.	Pumped Speed in Rev. per Minute.	SIZE OF PUMP		Capacity per Revolution.	Size of Section and Discharge.	TOTAL WORKING LIFT—100 FEET			TOTAL WORKING LIFT—175 FEET			TOTAL WORKING LIFT—350 FEET		
		Plunger, Inches.	Stroke, Inches.			Motor Size, H. P.	Motor Speed, R. P. M.	Price Pump only.	Motor Size, H. P.	Motor Speed, R. P. M.	Price Pump only.	Motor Size, H. P.	Motor Speed, R. P. M.	Price Pump only.
18	100 65	3	3	1.13 1.26	2	2	850 580	\$ 120.00 120.00	2	850 580	\$ 126.00 126.00	3	850 580	\$ 129.00 129.00
25	90 67	3	3	1.27 1.36	2	2	850 580	159.00 159.00	2	850 580	177.00 177.00	3	850 580	195.00 195.00
35	93 70	3 1/2	3	1.37 1.48	2 1/2	2	850 580	200.00 200.00	2 1/2	850 580	210.00 210.00	5	850 580	232.00 232.00
50	100 76	4	3	1.48 1.52	3	2 1/2	850 580	254.00 254.00	3	850 580	267.00 267.00	7 1/2	850 580	294.00 294.00
70	85 71	4	5	1.16 1.28	3	3	740 580	278.00 318.00	5	740 580	292.00 334.00	10	740 580	321.00 367.00
100	96 78 65 56	5	4 5 6 7	1.02 1.23 1.53 1.78	4	4	850 740 580 490	374.00 411.00 411.00 438.00	7 1/2	850 740 580 490	393.00 423.00 423.00 460.00	13	850 740 580 490	432.00 465.00 465.00 506.00
140	96 78 65 56	6	4 5 6 7	1.46 1.83 2.12 2.57	5	5	850 740 580 490	556.00 556.00 572.00 572.00	10	850 740 580 490	584.00 584.00 611.00 611.00	15	850 740 580 490	643.00 643.00 672.00 672.00
200	90 78 68 60	6	6 7 8 9	2.0 2.57 3.24 3.30	6	7 1/2	850 740 650 580	596.00 596.00 651.00 651.00	13	850 740 650 580	626.00 626.00 684.00 684.00	25	850 740 580 490	690.00 690.00 753.00 753.00
250	84 71 62 55	7	6 7 8 9	2.99 3.50 3.99 4.50	6	10	850 740 580 490	794.00 794.00 835.00 835.00	20	850 740 580 490	834.00 834.00 877.00 877.00	30	850 740 580 490	918.00 918.00 965.00 965.00
300	86 74 65 58	7 1/2	6 7 8 9	3.44 4.02 4.58 5.16	7	10	850 740 650 580	914.00 914.00 929.00 929.00	20	850 740 650 580	960.00 960.00 976.00 976.00	40	850 740 650 580	1,056.00 1,056.00 1,074.00 1,074.00
350	89 74 66 59	8	6 7 8 9	3.91 4.67 5.22 5.87	7	13	850 740 650 580	1,038.00 1,038.00 1,072.00 1,072.00	25	850 740 650 580	1,090.00 1,090.00 1,126.00 1,126.00	50	850 740 650 580	1,199.00 1,199.00 1,229.00 1,229.00
400	80 69 60 54 48	9	6 7 8 9 10	4.96 5.78 6.61 7.43 8.26	8	15	850 740 650 580 490	1,310.00 1,310.00 1,349.00 1,349.00 1,430.00	30	850 740 650 580 490	1,376.00 1,376.00 1,417.00 1,417.00 1,502.00	60	850 740 650 580 490	1,514.00 1,514.00 1,559.00 1,559.00 1,652.00

Made also for Working Lifts of 500, 700 and 1,000 feet.

Also furnished with Double Reduction Direct Gearing for operation with High Speed Stock Motors.

THE ALDRICH VERTICAL TRIPLEX BELT PUMP

SOLID WATER END PATTERN

For general description see Fig. 125 preceding.

SPECIAL FITTINGS AT ADDITIONAL COST

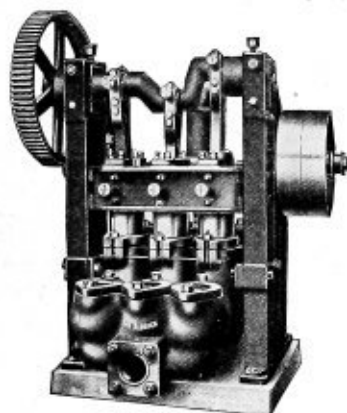


Fig. 150

Bronze Lined Throats and Glands, Bronze or Rawhide Pinions, Bypass and Check Valve, Water Relief Valve, Bronze Plungers.

Where the water contains a large quantity of solid matter, Iron, Bronze or Rubber Ball Valves can be supplied.

Pumps can be fitted with Chilled Iron Plungers and Metallic Packing, giving greatest wearing quality possible, and reducing friction.

Data Required for Quotation

- 1st. Maximum normal amount of water per minute.
- 2d. Total height of discharge.
- 3d. Character of water.
- 4th. If direct current motors, give voltage; if alternating, give voltage, number of cycles or alternations, phase, capacity and make of generator.
- 5th. Speed and size of driving pulleys.

Maximum Capacity in U. S. Gallons per Minute	Pump Speed in Rev. per Minute	Size of Pump		Capacity per Revolution	Size of Suction and Discharge	MAXIMUM WORKING LIFT 100 Feet			Approximate Weight of Pump, Lbs.	Price Pump
		Plunger, Inches	Stroke, Inches			Size of Tight and Loose Pulleys; Pul- leys Figured for Double Belt	Pulley Rev. per Minute Maximum Capacity	Maximum H. P. Required at Pulleys		
18	65	3	3	.276	2	10x3	325	1	770	\$ 110.00
25	67	3	4	.367	2	10x3	335	1	810	143.00
35	70	3½	4	.498	2½	10x3	350	1½	900	180.00
50	62	4	5	.816	3	10x3	310	2	1,380	250.00
70	53	5	5	1.27	3	12x3	265	3	1,760	380.00
85	56	5	6	1.53	4	12x3	280	3	2,080	390.00
100	56	5	7	1.78	4	15x3	280	4	2,450	400.00
140	56	6	7	2.57	5	18x4	280	6	3,400	515.00
175	53	6	9	3.30	5	20x4	265	7	3,800	586.00
200	57	7	7	3.50	6	20x4	285	8	4,500	715.00
250	55	7	9	4.50	6	24x5	275	9	5,500	752.00
300	52	8	9	5.87	7	30x5	260	12	7,950	965.00
350	48	9	9	7.43	7	32x5	240	14	11,700	1,215.00
400	48	9	10	8.26	8	32x5	240	16	14,000	1,290.00

MAXIMUM WORKING LIFT—175 Feet

Maximum Capacity in U. S. Gallons per Minute	Pump Speed in Rev. per Minute	Plunger, Inches	Stroke, Inches	Capacity per Revolution	Size of Suction and Discharge	Size of Tight and Loose Pulleys; Pul- leys Figured for Double Belt	Pulley Rev. per Minute Maximum Capacity	Maximum H. P. Required at Pulleys	Approximate Weight of Pump, Lbs.	Price Pump
18	65	3	3	.276	2	10x3	325	1	800	\$ 115.00
25	67	3	4	.367	2	10x3	335	2	855	160.00
35	70	3½	4	.498	2½	12x3	350	3	950	190.00
50	62	4	5	.816	3	12x3	310	3	1,525	263.00
70	53	5	5	1.27	3	15x3	265	4	1,860	380.00
85	56	5	6	1.53	4	18x4	280	5	2,200	395.00
100	56	5	7	1.78	4	18x4	280	6	2,500	415.00
140	56	6	7	2.57	5	24x5	280	9	3,600	550.00
175	53	6	9	3.30	5	30x5	265	11	4,050	618.00
200	57	7	7	3.50	6	30x5	285	13	4,750	750.00
250	55	7	9	4.50	6	32x5	275	16	5,350	790.00
300	52	8	9	5.87	7	34x6	260	19	7,800	1,000.00
350	48	9	9	7.43	7	36x6	240	22	12,400	1,250.00
400	48	9	10	8.26	8	38x6	240	25	14,700	1,350.00

Made also for working lifts of 350, 500, 700 and 1,000 feet.

ALDRICH ELECTRIC MINE SINKING PUMP

SINGLE ACTING

MAXIMUM WORKING LIFT, 350 FEET

Capacity in Gallons per Minute	SIZE PUMP		Capacity per Revolution	Size of Suction and Discharge	H. P. of Motor, Approx. 850 R. P. M.	Approx. Weight of Pump Alone, Lbs.	Price of Pump Alone	Extra for Telescope Discharge
	Plunger, Inches	Stroke, Inches						
46	3	5	.46	2 1/2	7 1/2	1,600	\$ 370.00	\$ 38.00
60	3 1/2	5	.63	2 1/2	7 1/2	1,900	435.00	38.00
80	4	5	.81	3	10	2,100	510.00	50.00
110	4	7	1.14	3 1/2	15	2,500	600.00	63.00
140	4 1/2	7	1.44	3 1/2	20	3,100	700.00	63.00
175	5	7	1.78	4	25	3,650	790.00	76.00
200	5 1/2	7	2.16	5	25	4,000	890.00	101.00
275	6	7	2.57	5	35	4,700	1,000.00	101.00
300	6	9	3.30	5	40	5,200	1,200.00	101.00
356	6 1/2	9	3.88	6	45	6,300	1,300.00	127.00
400	7	9	4.50	6	50	7,500	1,575.00	127.00

580 R. P. M. Motor preferred.

See Fig. 125 pumps for data required for quotation.

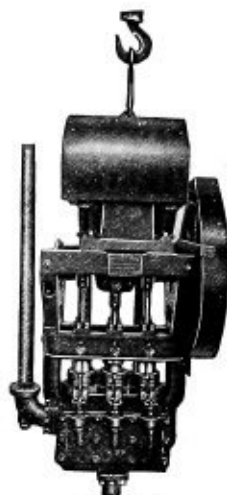


Fig. 111

ALDRICH TRIPLEX TRACK PUMP



Fig. 119

Fig. 119 shows a horizontal triplex pump designed for slopes, inclined shafts or for pumping out inside dips.

The machine is compact, with all working parts completely accessible, requires little head room and is mounted on truck to meet any gauge. The castings are exceptionally heavy and coated inside with acid-resisting paint. It may be fitted with double reduction gearing in case it is desired to operate with high speed motor.

Also furnished with bronze water end, including glands, plungers and all parts coming in contact with the water where liquid is highly charged with acid.

Maximum Capacity in U. S. Gallons per Minute	SIZE		Size of Suction and Discharge	MAXIMUM WORKING LIFT, 100 FEET			MAXIMUM WORKING LIFT, 175 FEET			MAXIMUM WORKING LIFT, 300 FEET		
	Plunger, Inches	Stroke, Inches		H. P. of Motor	Approx. Weight of Pump Only, Lbs.	Price of Pump Only	H. P. of Motor	Approx. Weight of Pump Only, Lbs.	Price of Pump Only	H. P. of Motor	Approx. Weight of Pump Only, Lbs.	Price of Pump Only
25	3	4	2	2	1,400	\$ 310.00	3	1,400	\$ 310.00	5	1,500	\$ 360.00
35	3 1/2	4	2 1/2	3	1,400	310.00	3	1,400	310.00	5	1,500	360.00
50	4	4	3	3	1,875	378.00	5	1,875	388.00	7	1,975	450.00
70	4	5	3 1/2	5	1,875	378.00	7	1,875	388.00	8	1,975	450.00
100	5	6	4	5	2,600	486.00	8	2,700	486.00	10	2,900	558.00
140	5 1/2	7	5	7 1/2	4,200	590.00	10	4,400	600.00	13	4,600	665.00
170	6	7	5	8	4,400	615.00	13	4,600	625.00	15	4,900	715.00
200	6 1/2	7	6	10	5,400	725.00	13	5,600	750.00	20	6,300	850.00
240	7	7	6	10	5,600	750.00	15	5,800	800.00	25	6,500	925.00
280	7	9	7	13	7,300	925.00	18	7,600	975.00	30	8,500	1,075.00
350	8	9	7	15	8,400	1,100.00	20	9,100	1,180.00	40	11,000	1,360.00

See Figs. 125 and 150 pumps for data required for quotation.

Electric Triplex and Quintuplex Station Pumps quoted upon request.

CHANNON VERTICAL CENTRIFUGAL PUMPS



Fig. 791
Submerged Type

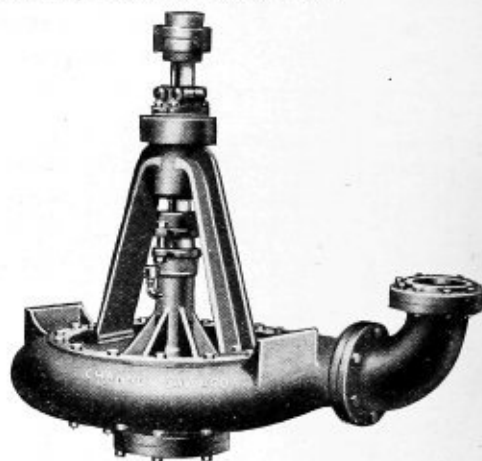


Fig. 800
Suction Type

These pumps are fitted with castings at each side for bolting to vertical timbers, supporting pump and shafting as shown on next page. This outfit is used by contractors and quarry companies, as it is simple and requires no foundation, the timber frame with pump and shafting is lowered into the pit or excavation as added depth is needed.

Fig. 791. Submerged Type

Fig. 791 is the popular style; it is entirely submerged in the liquid to be pumped and needs no priming to start it. The weight of the shaft is supported by the yoke, which has a bearing with adjustment at the top.

By simply removing the nuts at the top of the shell, all of the running parts, including the runner, can be removed for inspection from the top of the pump, without disturbing the suction or discharge pipe. The gland is provided with a water seal.

Fig. 800. Suction Type

This pump has suction flange in bottom to which the well casing may be directly attached. A vertical frame is used as in Fig. 791 and as shown on next page, it may be placed with safety in pits where there is danger of water accumulating, as it will run submerged. Used extensively for irrigation and on rice plantations.

No. Pump	Capacity Gallons per Minute	Size of Pipe		Pulley		Coupling Bored for	Approximate Weight, Lbs.	Fig. 791	Fig. 800
		Discharge, Inches	Suction, Inches	Diameter, Inches	Face, Inches			Price Iron Pump	Price Iron Pump
1½	75	1½	2	4	4	1½ in. shaft	125	\$ 44.00	\$ 45.00
2	125	2	2½	4	4	1½ "	140	74.00	75.00
2½	185	2½	3	6	6	1½ "	235	88.00	90.00
3	265	3	4	7	6	1½ "	270	108.00	110.00
3½	370	3½	5	7	8	1½ "	370	118.00	120.00
4	400	4	6	8	8	1½ "	410	125.00	130.00
5	750	5	7	9	10	1½ "	560	160.00	165.00
6	1100	6	8	10	10	1½ "	630	190.00	200.00
8	2200	8	10	14	12	1½ "	1100	300.00	310.00
10	3300	10	12	16	16	2½ "	2100	380.00	375.00
12	4500	12	15	20	16	2½ "	2510	475.00	500.00
15	7300	15	18	24	16	2½ "	3000	825.00	850.00

Price covers pump, as shown in cuts, including pulley of size listed.

For extra shaft, bearings and couplings, prices upon request.

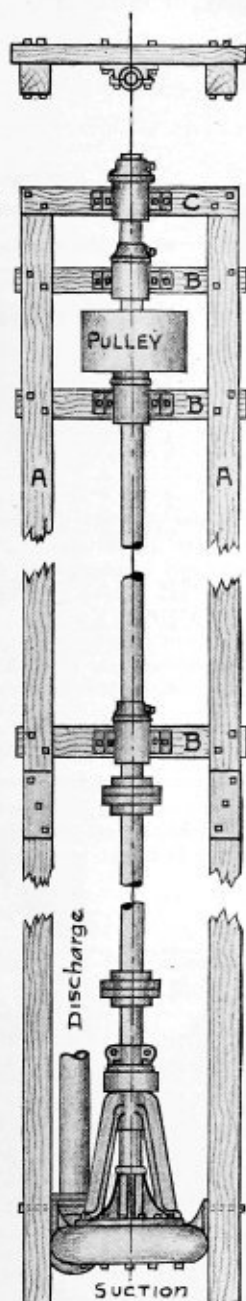
Speed and horsepower required, see pages following.

Fig. 791—Nos. 4 and 6 are the favorite sizes for quarries and contractors and can be furnished with cast steel runners at a slight advance.

Brass fitted or all brass pumps quoted upon request.

ARRANGEMENT OF SHAFTING FOR DRIVING OUR VERTICAL CENTRIFUGAL PUMPS

The illustration on this page shows the usual arrangement of shafting to drive our Vertical Centrifugal Pumps in deep pits, trenches, etc. Each length of shaft is provided with two bearings and the set collars so placed above each bearing that the weight of each section of shafting is carried on its own bearings, thus removing the weight of shaft from the pump. Jaw couplings connect ends of the shaft. The standard length of each section of shaft is 20 feet. Shorter lengths can be supplied as needed. Great care should be taken to see that the shafting is properly lined up with the pump, as most difficulties experienced with vertical pumps are caused by improper setting of the pump and shafting.



Split Bearing



Set Collar



Jaw Coupling

Prices Shafting, Couplings and Bearings

No. of Pump	Diameter of Shaft	Price Shaft, per Lb.	Price Split Bearings, Each	JAW COUPLINGS		Price Set Collars, Each
				Fitted Each	Not Fitted, Each	
1½	1½	\$0.05½	\$3.00	\$10.00	\$ 7.00	\$0.75
2	1½	"	3.00	10.00	7.00	.75
2½	1½	"	3.00	10.00	7.00	.75
3	1½	"	3.00	10.00	7.00	.75
3½	1½	"	3.25	12.00	8.00	1.00
4	1½	"	3.25	12.00	8.00	1.00
5	1½	.05	3.75	12.75	8.50	1.20
6	1½	"	3.75	12.75	8.50	1.20
8	1½	"	5.00	13.50*	9.00	1.40
10	2	"	6.25	15.75	11.25	1.60
12	2	"	6.25	15.75	11.25	1.60
15	2	"	6.25	15.75	11.25	1.60

Sizes of Timber

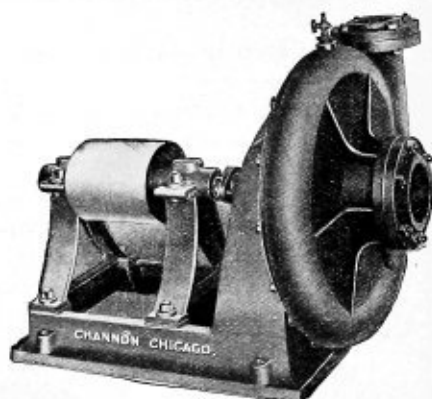
No. of Pump	Diameter of Shaft	PULLEY		SIZE OF TIMBERS		
		Diameter	Face	A	B	C
1½	1½	4	4	4"x4"	2"x4"	2"x4"
2	1½	4	4	"	"	"
2½	1½	6	6	"	4"x4"	"
3	1½	7	6	"	"	"
3½	1½	7	8	"	"	2"x6"
4	1½	8	8	"	"	"
5	1½	9	10	6"x6"	"	"
6	1½	10	10	"	"	"
8	1½	14	12	"	4"x6"	4"x6"
10	2	16	16	8"x8"	4"x8"	4"x8"
12	2	20	16	"	"	"
15	2	24	16	"	"	"

Fig. 791—Submerged Type on Timber Frame

CHANNON HORIZONTAL CENTRIFUGAL PUMPS

Extremely Simple
and
Efficient

No Valves of Any Kind
to Get Out of Order



For Pumping
Large Quantities
of Muddy and Gritty
Water.
Rapid and Economical

Fig. 780

This is the favorite style of pump for rapid handling of large quantities of water or other liquids at a very low cost. It is not affected by mud or grit and will pump a fair percentage of sand and other foreign matter without appreciable wear. May be belted to any power and is adapted for discharge heads up to 60 feet; for speeds and horse power required see following pages.

Extremely simple in every way—pump consists of one casting, the fan or impeller rotating inside the shell—no valves of any kind to get out of order. Pumps hot or cold liquids equally well. No expensive foundations required, as pump receives the liquid without shock or jar and delivers it in a continuous, steady stream.

These pumps are well designed and heavily constructed throughout. The case or shell is of the solid type, very heavy, and the runner of large diameter, adapting the pump for slow speed. The inside of case is machine finished and the runner machined and accurately fitted to it. Our construction gives a closer running fit and much greater efficiency than can be obtained in the old style split case. The shaft is large and bearings generously proportioned, an ample stuffing-box and gland being provided. The discharge can be readily adjusted at any angle.

No. Pump	Capacity, Gallons per Minute	SIZE OF PIPE		STANDARD PULLEY		Approximate Weight, Lbs.	Price of Iron Pump
		Discharge	Suction	Diameter	Face		
1½	75	1½ inches	2 inches	4 inches	4 inches	125	\$ 45.00
2	125	2 inches	3 inches	6 inches	6 inches	240	75.00
2½	185	2½ inches	3 inches	7 inches	6 inches	300	90.00
3	265	3 inches	4 inches	7 inches	8 inches	375	110.00
3½	370	3½ inches	5 inches	8 inches	8 inches	390	120.00
4	480	4 inches	5 inches	10 inches	8 inches	470	130.00
5	750	5 inches	6 inches	10 inches	10 inches	700	165.00
6	1,100	6 inches	8 inches	14 inches	12 inches	1,100	225.00
8	2,200	8 inches	10 inches	16 inches	12 inches	1,400	310.00
10	3,300	10 inches	12 inches	16 inches	16 inches	2,200	395.00
12	4,500	12 inches	15 inches	20 inches	16 inches	2,800	500.00
15	7,300	15 inches	18 inches	24 inches	16 inches	3,200	850.00
18	10,500	18 inches	20 inches	20 inches	20 inches	5,400	1,300.00

For priming attachments, speeds and horse power see following pages.

Brass pumps or brass fitted pumps quoted upon request.

Belting, suction hose, pipe and fittings, foot valves, etc., listed elsewhere in catalog.

CHANNON HORIZONTAL CENTRIFUGAL PUMPS

Fig. 870 With Hand Suction Primer

Fig. 870 is the same pump as the Fig. 780 shown elsewhere with the exception that a hand suction primer is added. At times it is desirable to prime the smaller pumps by hand.

This may be done by opening the air cock at the top of the shell and then using the hand pump on the primer until the water flows from the air cock, when the pump can be started.

On sizes above 8 inches it is advisable to use an ejector and either a foot valve or a flap valve, as described on following pages. No foot valve or flap valve is necessary when the hand primer is used.

No. Pump	Capacity Gallons	SIZE OF PIPE		PULLEY		Price of Iron Pump
		Disch. In.	Suct. In.	Diam. In.	Face In.	
1½	75	1½	2	4	4	\$ 60.00
2	125	2	3	6	6	95.00
2½	185	2½	3	7	6	110.00
3	265	3	4	7	8	135.00
3½	370	3½	5	8	8	145.00
4	480	4	5	10	8	160.00
5	750	5	6	10	10	200.00
6	1,100	6	8	14	12	270.00
8	2,200	8	10	16	12	375.00

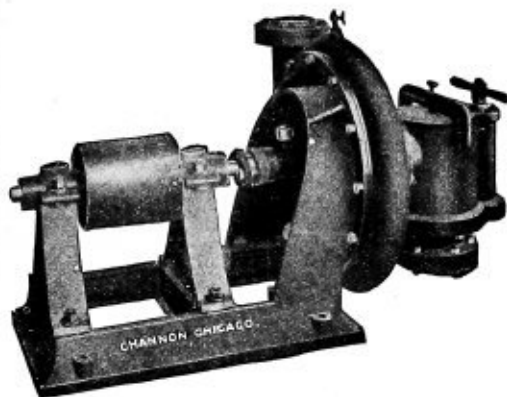


Fig. 870. Pump With Hand Suction Primer

HORIZONTAL SIDE SUCTION CENTRIFUGAL PUMPS, DIRECT CONNECTED TO VERTICAL STEAM ENGINE

Combined outfits of this kind are often used where but little elevation is required, owing to their compactness and portability. It is not possible to run engines at the high speeds necessary for high elevations, consequently these outfits can only be used against heads of 25 to 30 feet maximum. Different sized engines are offered, adaptable to various steam pressures. We give below a partial list of standard sizes. We connect our side pumps to any form of engine and will quote on special outfits when requirements are given us.



Fig. 900

No. Pump	Capacity Gallons	SIZE OF PIPE		SIZE OF ENGINE		Price
		Discharge, Inches	Suction, Inches	Diameter, Inches	Stroke, Inches	
2	125	2	3	3½	3½	\$220.00
2	125	2	3	3	5	225.00
2	125	2	3	3½	5	230.00
2½	185	2½	3	3½	3½	240.00
2½	185	2½	3	3	5	245.00
2½	185	2½	3	3½	5	250.00
3	265	3	4	3½	3½	260.00
3	265	3	4	3	5	265.00
3	265	3	4	3½	5	270.00
3	255	3	4	4	5	275.00
3½	370	3½	5	3½	3½	280.00
3½	370	3½	5	4	5	290.00
4	480	4	5	4	5	310.00
4	480	4	5	4½	5	320.00
5	750	5	6	4	5	350.00
5	750	5	6	4½	5	360.00
5	750	5	6	5	7½	380.00
5	750	5	6	6	7½	400.00
6	1,060	6	8	5	7½	420.00
6	1,060	6	8	6	7½	440.00
8	2,200	8	10	7½	8	610.00
8	2,200	8	10	7½	9	630.00

Prices are for engine complete with throttle valve, oil cups, and cylinder lubricator. Ejectors furnished only when ordered, and are charged extra.

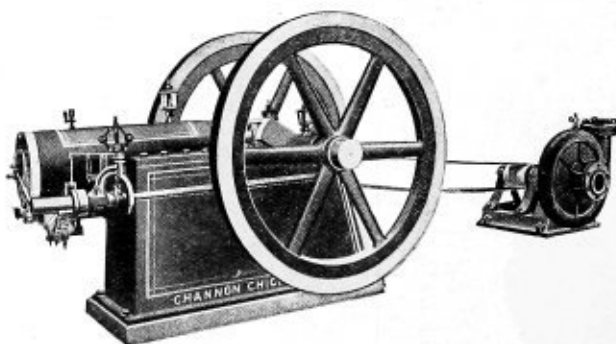
MOTOR DRIVEN CENTRIFUGAL PUMPS**Fig. 782**

Built in single stage type for total heads of 60 feet or less, connected to motor by gear, silent chain or by direct coupling of shafts.

In asking for prices be sure to state Current and Voltage, Greatest Suction Lift and Discharge Head.

GASOLINE PUMPING OUTFITS

For
Irrigation
Work,
Drainage,
Etc.

**Fig. 785**

An
Inexpensive
Pumping
Plant of
Large
Capacity

A gasoline engine belted to one of our horizontal centrifugal pumps makes an efficient plant for pumping water, sewage, and for a great many other purposes. These outfits are used largely in the western irrigation districts. They require practically no attention beyond starting the gasoline engine.

Prices quoted on complete outfits upon receipt of inquiry stating conditions.

ELECTRIC CENTRIFUGAL PUMPS

OR AUTOMATIC SEWAGE EJECTORS

For Pumping Sewage, Draining Basements, Etc.

It is entirely automatic in its action, and, as the shell is constantly submerged in the liquid to be pumped, no priming is necessary. The motor is controlled by a float so arranged that the motor starts automatically when the liquid reaches a given height in the pit, stopping when it is empty. In construction, the pump, discharge pipe, etc., are supported from the pit cover, so that all parts of the outfit can be removed for inspection or repair by simply lifting this pit cover. The pit may be of iron, brick or concrete.

We are prepared to furnish outfits of any capacity to suit any conditions. We solicit inquiries which should state the character and amount of liquid to be pumped, together with the diameter and depth of pit, total height to which the liquid is to be raised, voltage and kind of electric current.

We offer the following standard sizes:

No. 1 Capacity 50-100 gallons per minute.

No. 2 Capacity 125-200 gallons per minute.

No. 3 Capacity 250-400 gallons per minute.

Regular construction includes pump and pit cover for pit 36 inches inside diameter and 5 feet in depth, together with motor and float switch, as shown in illustration.

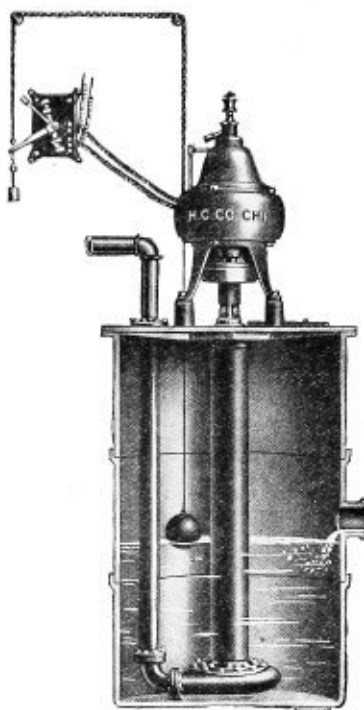


Fig. 905

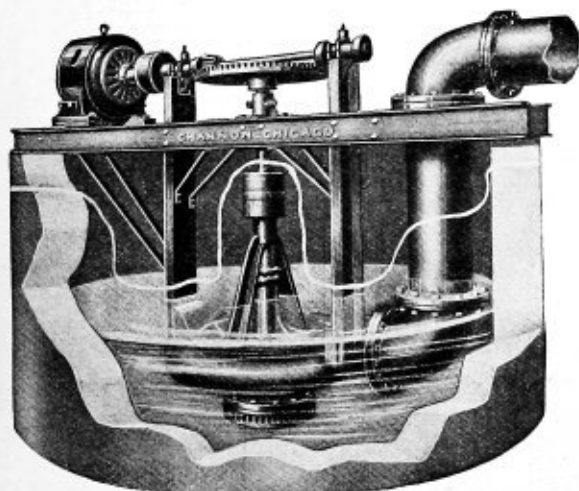


Fig. 906

Fig. 906 shows a larger outfit than above with Vertical and Horizontal Steel Supports, adapted to wider and deeper pits.

Pump is connected through gears to Horizontal Motor, making a slow speed outfit.

When asking for prices be sure to state capacity, depth, current and voltage.



Belted Pump
Figure 1005

HYDRAULIC SAND AND DREDGING PUMPS

WITH OR WITHOUT
STEEL LINING



Pump with Single Vertical Engine
Direct Connected
Figure 1010

These pumps are furnished complete with suction and discharge elbows, flap valve and ejector for priming. The pump shell is in one casting, very heavy, with extra metal provided in such parts that are most subject to wear. A removable disc is fitted to suction side of shell, which gives easy access to the inside of the pump or for removal of piston. The piston is of the enclosed type, lined with steel plates, and is of large size for moderate speed. There is ample space between piston and pump shell so a stone cannot get wedged in and wreck the pump. Stuffing-box bearing is adjustable for wear and is fitted with water injection to keep sand out of bearing. The frame is especially heavy and free from springiness. Pillow blocks have large and ample surface, and pedestals are very stiff and heavily ribbed. Shaft is extra large and pulley is ample. Suction elbow is furnished with hand hole easily removed. The pump is balanced for end thrust.

Specifications also apply to dredging pumps with engines directly connected. We can furnish any pump with steel lining for the periphery of pump shell, or pump in which every part coming in contact with the material has removable liners.

BELTED PUMPS

No. Pump (Diameter Discharge Opening)	Diameter Suction	Cubic Yards Material Per Hour, 10 to 20 Per Cent of Solids			Horse Power Required for Each 10 Feet Elevation	Will Pass Solids: Diameter, Inches	Diameter and Face of Pulley	Floor Space Required, Inches	Shipping Weight	Price of Pump with Suction and Discharge Elbow, Flap Valve and Ejector	Price Extra for Steel Lining
		10%	15%	20%							
4	4	14	21	28	4	2	12 x 12	40 x 31	980	\$ 210.00	\$ 70.00
6	6	30	45	60	8	4 1/4	20 x 12	68 x 40	2,125	300.00	100.00
8	8	60	90	120	15	6	24 x 14	72 x 48	3,670	475.00	130.00
10	10	90	135	180	25	8	30 x 15	94 x 54	4,975	600.00	170.00
12	12	125	190	250	30	10	36 x 20	114 x 66	7,825	850.00	230.00
15	15	210	315	420	50	10	42 x 24	154 x 78	15,200	1,775.00	.....
18	18	300	450	600	70	10	48 x 30	160 x 80	16,125	2,000.00	.....
20	20	360	540	720	80	10					
24	24	480	700	960	100	10					
32	32	900	1,350	1,800	200	10					
36	36	1,140	1,710	2,280	250	12					
48	48	2,040	3,220	4,080	450	12					

Prices on application

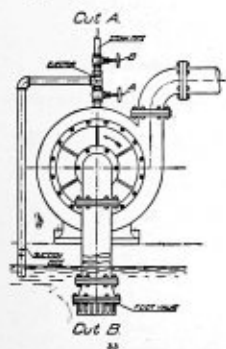
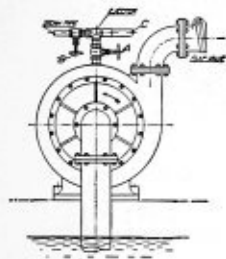
PUMPS DIRECT-CONNECTED TO VERTICAL STEAM ENGINES

No. Pump (Diameter Discharge Opening)	Suitable for Elevations in Feet up to	Description of Engines	SIZE OF STEAM CYLINDERS		Size Steam Pipe, Inches	Size Exhaust Pipe, Inches	Shipping Weight, Lbs.
			Diameter	Stroke			
4	15	Single	6	6	1 1/4	1 1/4	1,400
4	25	Double	4	4	1 1/4	1 1/4	2,100
6	20	Single	7	7	1 1/2	2	3,000
6	27	Double	5	5	1 1/2	2	3,800
8	25	Single	8	8	1 3/4	2 1/4	4,800
8	30	Double	7	7	2 1/4	3	6,200
10	25	Single	10	10	2 1/4	3	6,500
10	30	Single	12	10	2 1/4	3	11,000
10	35	Single	12	12	3	3 1/4	14,000
10	30	Double	8	8	2 1/2	3	7,500
10	38	Double	9	9	3	4 1/4	12,200
10	55	Double	12	10	3	4 1/4	16,000
12	25	Single	12	12	3	3 1/2	10,500
12	30	Single	14	14	3	4	16,000
12	38	Double	9	9	3	4 1/4	12,000
12	45	Double	12	10	3 1/4	5	17,000
12	70	Double	14	12	5	6	21,000
15	35	Double	12	12	4	5	24,000
18	35	Double	14	12	5	6	26,000

Revolutions and Horse Power Required to Elevate Water to Different Heights—Not Allowing for Friction Loss of Water in Pipes, which Must be Taken into Consideration

No. Pump.	Capacity, Gallons	Horse Power per Foot Elev.	5 Foot	10 Foot	15 Foot	20 Foot	25 Foot	30 Foot	35 Foot	40 Foot	50 Foot	60 Foot
1½	75	.058	642	784	904	1,010	1,104	1,193	1,274	1,352	1,493	1,622
2	125	.10	364	443	511	570	623	672	718	762	840	913
2½	185	.15	389	448	500	547	590	630	667	703	770	830
3	265	.22	286	359	419	475	517	559	599	636	704	766
3½	370	.26	352	413	455	513	555	595	632	667	733	793
4	480	.30	324	390	445	493	539	580	618	654	721	771
5	750	.45	311	368	418	462	502	532	574	606	666	722
6	1,100	.59	247	300	345	385	421	453	484	513	566	615
8	2,200	1.00	293	345	390	430	466	500	532	561	617	667
10	3,300	1.52	160	226	278	320	358	392	424	456	506	555
12	4,500	2.00	133	188	230	266	298	326	352	376	421	461
15	7,300	3.50	151	213	261	301	337	369	399	426	477	522
18	10,500	4.50	151	213	261	301	337	369	399	426	477	522

DIRECTIONS FOR SETTING UP AND OPERATING CENTRIFUGAL PUMPS



Set the pump as close to the water as possible and arrange both suction and discharge pipes so as to use as few elbows as possible. Never set the pump more than 20 feet above the water to be pumped.

Warm water cannot be lifted as high by suction as cold water, and very hot water must flow to the pump.

Note speed of pumps given in above table.

Be absolutely sure that every joint in the suction pipe is tight.

Before starting it is necessary that the pump and suction pipe be entirely filled with water, in order to prime the pump. The best method of doing this, if steam is at hand, is by means of an ejector and either a flap valve on the discharge, or a foot valve on the suction.

On this page are two illustrations showing the arrangement and piping of the ejector in both cases.

If a flap valve is used (cut A), open the suction valve A and then the steam valve B. Allow the ejector to work until a good stream of water is discharged at C. Then close the suction valve A, and then the steam valve B, and start the pump. Be sure to close valve A first.

If a foot valve is used (cut B), open the discharge valve A and then the steam valve B. Allow the ejector to work until the pump is entirely filled. Then close the valves and start the pump.

If steam is not available, a foot valve as shown in cut B may be used and the pump filled at the opening in the top of the shell by means of a hose or by pouring in water.

On 8-inch and smaller pumps, a hand suction primer may be used, but we do not recommend it for sizes above 8 inches.

See that the pump runs in the direction of the spiral.

Drain the pump in cold weather, to prevent freezing, by unscrewing the plug in the bottom of the pump shell.

Ejectors for Priming by Steam

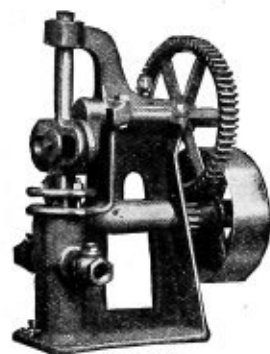


No. Pump	No. Ejector	Diameter Steam Pipe, Inches	Diameter, Suct. and Disch., Inches	Price Ejector Complete with Valves	Price, Ejector Only
1½	1	¾	½	\$15.00	\$ 8.00
2	1	¾	½	15.00	8.00
2½	1	¾	½	15.00	8.00
3	2	½	¾	19.00	10.00
3½	2	½	¾	19.00	10.00
4	3	¾	1	27.50	15.00
5	4	1	1½	38.00	20.00
6	4	1	1½	38.00	20.00
8	5	1	1½	45.00	25.00
10	5	1	1½	45.00	25.00
12	6	1¼	2	65.00	35.00
15	6	1¼	2	65.00	35.00

For Tables and Useful Information see back part of this book.

LUCAS POWER PUMPS

For Boiler Feeding, Filling Tanks, Pumping Molasses, Juices, Paints and Other Thick Liquids, Hot or Cold



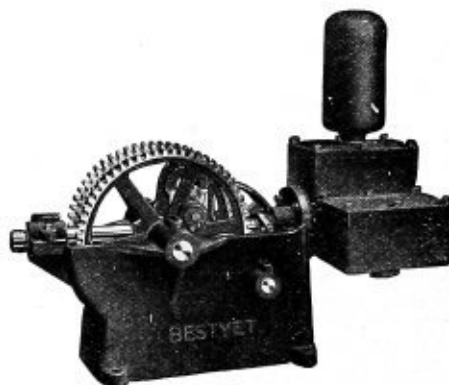
Nos. 8-9

No.	Piston, Inches	Stroke, Inches	Pipes, Inches	Pulley	Price	Boiler Power	Weight, Lbs.	Gals. Per Hr.
1	1	2	3/8	12x2	\$ 18.00	3	35	18
2	1 1/8	2 1/2	3/8	14x2	20.00	5	45	30
2A	1 1/8	2 1/2	3/8	14x2	32.00	5	55	30
3	1 1/4	3	1/2	16x3	24.00	10	65	60
3A	1 1/4	3	1/2	16x2	38.00	10	80	60
4	1 1/2	3	3/4	16x3	28.00	15	75	90
5	2	3	1	18x4	32.00	30	130	180
6	2 1/2	3	1	18x4	38.00	45	170	270
7	2	6	1 1/4	22x4	50.00	60	200	360
8	2 1/2	6	1 1/4	14x4	70.00	80	300	408
9	3	6	1 1/2	14x4	85.00	100	400	600
11	4	6	2 1/2	18x4	150.00	300	700	1800
12	5 1/2	8	3	20x4	200.00	500	900	3500

The capacities are rated at fifty strokes per minute. Numbers 1 to 9 inclusive are single acting; numbers 11 and 12 are double acting; numbers 2A, 3A, also 11 and 12 geared 5 to 1; numbers 8 and 9 are geared 4 to 1; numbers 2A and 3A are geared like 8 and 9.

THE "BESTYET" POWER PUMP

100 lbs. Pressure
230 Ft. Elevation



Rubber Valves with
Brass Seats, Stems
and Springs

Valves are made to handle hot or cold liquids. The piston is much the same as on a steam pump and is packed with square rubber packing. The large gear has long hub, into which is fastened the crank pin, on which pin runs a pressed steel roller, held within the link by the crank plate. The power given to the pulley is transferred to the crank pin through the two gears.

The Bestyet Style B pump is a special design made for handling liquids containing solid substances or thick liquids which clog the valves. It is used for pumping brine, molasses, paint, etc. For such work the cylinder should be brass lined. This pump should not be used for more than 100 feet elevation. The valves can be easily reached by removing the side and top plates on the cylinder while pump is running. Same price as regular pump.

No.	Cylinder, Inches	Stroke, Inches	Suction, Inches	Discharge, Inches	Capacity, Gallons Per Hour	Size Pulley	Geared	H. P. Reg. 200 Feet Elevation	Weight, Lbs.	Price	Price, Brass Lined
1	3 1/2	5	1 1/2	1	1,200	12x3	5 to 1	1	250	\$ 70.00	\$ 72.00
2	4 1/2	6	2	1 1/2	2,200	14x4	5 to 1	2	450	80.00	82.00
3	5 1/2	7	2 1/2	2	4,200	16x5	5 1/2 to 1	4	700	130.00	133.00

Speed Nos. 1 and 2, 250 R. P. M.; No. 3, 285 R. P. M.

CHANNON DIAPHRAGM TRENCH PUMPS

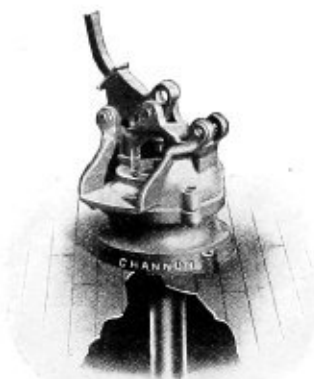
Non-Chokable, for Pumping Dirty and Gritty Water

For Contractors, Railroads, Foundation and Bridge Builders, Water-Works, Etc.

We Guarantee our Pumps to Handle More Water with Less Labor than any Other Pump of this Class Made.



Side Suction—For Hose



Bottom Suction—For Pipe

These pumps are the best and most efficient hand pumps on the market. They will quickly and easily dispose of large quantities of drainage or sewage matter, sanitary deposits, mud, gravel and quicksand. They have large, open valve ways especially adapted for handling this class of pumpage.

We make three sizes of pumps to take 2½, 3 and 4-inch diameter suction hose or pipe. The 3-inch and 4-inch size suction pumps are the most popular. We carry suction hose with couplings attached, in 8, 10, 12, 15, 18 and 20-foot sections, in stock. This hose is especially made for us of a high quality rubber, made up on heavy flat, spirally wound galvanized wire. This hose has proven in long service to be exactly what is required for this class of pump. The advantage of a side suction over the bottom suction is obvious—the hose can be shifted about without disturbing the pump.

Pump Number	Size of Suction Hose or Pipe, Inches	Capacity in Gallons per Hour	Side Suction		Bottom Suction		Price per Foot of Hose Including Couplings	Price of Galvanized Iron Strainer Each	Extra Diaphragms Each
			Weight of Pump, Pounds	Price of Pump Only	Weight of Pump, Pounds	Price of Pump Only			
1	2½	1,500	95	\$19.00	90	\$14.00	\$1.50	\$2.00	\$2.50
2	3	3,500	175	24.00	170	16.00	2.00	2.50	3.00
3	4	6,000	300	35.00	290	25.00	3.25	3.75	4.00

Piping for Bottom Suction Pumps furnished in any length desired.

Our Standard No. 2 Pumping Outfit, weight 250 lbs., consisting of one No. 2 Channon side suction diaphragm pump, fitted with nipple, one 12-foot section of 3-inch diameter special suction hose, with couplings attached, one strainer, one extra rubber diaphragm, and handle for pump, in fact everything complete ready to operate.....Price, **\$50.00**

Our Standard No. 3 Pumping Outfit, weight 423 lbs., consisting of one No. 3 pump, 12 feet of 4-inch suction hose and all fittings named in No. 2 outfit, complete.....Price, **\$75.00**

Other combined outfits quoted upon request.

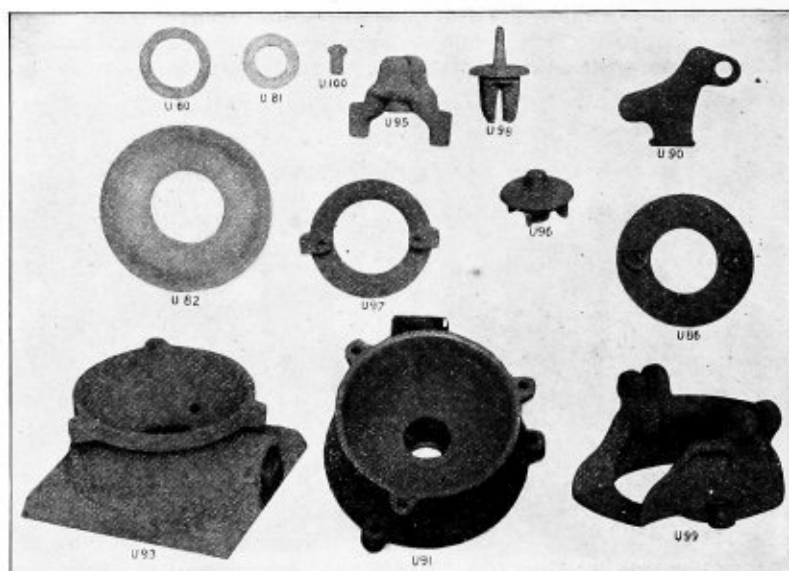
Bottom Suction Diaphragm Pumps, complete with pipe. Prices quoted upon request.

We can furnish immediately from stock the lengths of hose mentioned above. We can make shipment of any combination same day order is received.

For repair parts see following page.

For Suction Hose see Other Pages

REPAIR LIST FOR CHANNON DIAPHRAGM PUMPS



No.	Name and Description of Parts	PRICE EACH		
		For No. 1 Pump	For No. 2 Pump	For No. 3 Pump
U 80	Large Rubber Gasket.....	\$0.30	\$0.40	\$ 0.60
U 81	Small " ".....	.25	.35	.50
U 82	Rubber Diaphragm.....	2.50	3.00	4.00
U 96	Lower Saucer.....	.30	.60	1.25
U 90	Brake Socket.....	.50	.85	1.50
U 91	Bottom for Bottom Suction.....	4.50	6.50	10.00
U 93	Bottom for Side Suction.....	5.50	7.50	12.00
U 95	Cross Head.....	.30	.75	1.50
U 96	Upper Valve.....	.55	.75	1.50
U 97	Upper Saucer.....	.20	.50	1.00
U 98	Lower Valve.....	.40	.60	1.25
U 99	Top or Dome.....	3.00	4.50	6.00
U 100	Valve Stop.....	.10	.15	.25
	Handle.....	1.50	2.25	3.00
	Socket Pins.....	.10	.15	.25

DIAPHRAGM MANHOLE PUMPS

Galvanized Iron

For pumping out subways and manholes. Not affected by sand or gravel. Capacity, 1,500 gallons per hour.

No. 0 BOTTOM INLET FOR IRON PIPE

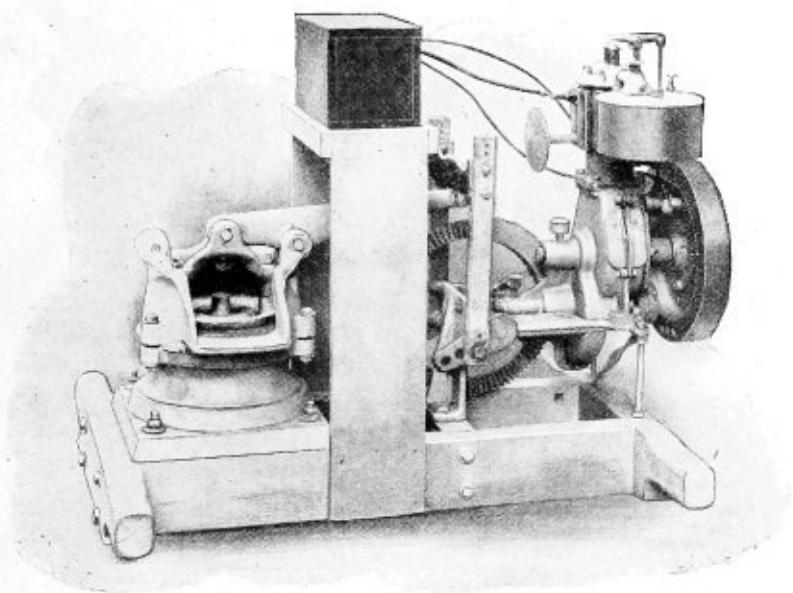
Suction 2 inches, discharge 1½ inches. Price, net.....\$25.00

No. 1 SIDE SUCTION FOR HOSE

Suction 2 inches, discharge 1½ inches. Price, net.....\$30.00



PORTABLE GASOLINE TRENCH PUMP OUTFIT



A complete power-driven outfit for raising large quantities of water, and to handle water containing sewage, mud, sand, gravel, etc.

The pump is described on another page and is our No. 2 Standard Channon Diaphragm pump, having 3 inch side suction. Thousands of them are in use by contractors, railroads, etc.

The engine is the well known Fuller and Johnson, and is simple, compact and self-contained. The successful combination of the two into a portable outfit is the only new feature.

The saving in cost of operation alone, as compared to the usual man power, is a great item, leaving out of consideration the greatly increased capacity. The engine exerts a pull of about 1000 lbs. on the lever and makes 31 to 35 strokes per minute, giving a capacity of about 3,500 gallons per hour.

The only attention or expense required to operate our power outfit is to supply the necessary gasoline and lubricating oil. A 10 hour continuous run will consume approximately two quarts of gasoline, or at a total expenditure of not over 12 to 15 cents. It is there, ready for work when you want it, and as you want it, day shift or night shift.

Outfit No. 562. Consisting of Pump and Engine, mounted on frame as shown, including 15 feet of special high-grade rubber suction hose with couplings and strainer, complete ready to run..... \$175.00

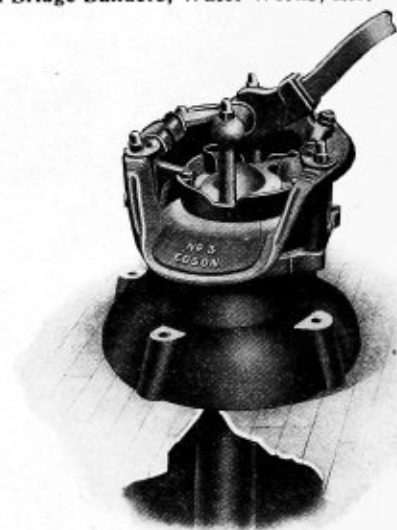
EDSON DIAPHRAGM TRENCH PUMPS

For Pumping Dirty and Gritty Water

For Contractors, Railroads, Foundation and Bridge Builders, Water Works, Etc.



Side Suction, for Hose



Bottom Suction, for Pipe

No.	Suction Hose, Inches	Capacity per Stroke, Gallons	Length of Stroke, Inches	Side Suction		Bottom Suction		Price of Galv. Iron Strainers	Price per ft. of Hose, Including Couplings	Extra Diaphragms, Price, Each
				Weight, Lbs.	Price, Each	Weight, Lbs.	Price, Each			
2	2½	½	2¼	112	\$19.00	104	\$14.00	\$2.00	\$1.50	\$3.00
3	3	1	3	185	24.00	160	16.00	2.50	2.00	4.00
4	4	2	4	285	35.00	280	25.00	3.75	3.25	5.00

No. 2 compares in size with Channon Non-Chokable No. 1, No. 3 with Channon Non-Chokable No. 2, and No. 4 with Channon Non-Chokable No. 3.

As with Channon Non-Chokable Pumps (shown on page 173), we furnish the Edsons complete with hose.

No. 3 Edson Pumping Outfit, weight 250 lbs., consisting of one No. 3 side suction diaphragm pump, fitted with nipple, one 12-foot section of 3-inch diameter special suction hose, with couplings attached, one strainer, one extra rubber diaphragm, and handle for pump, in fact everything complete ready to operate Price, \$60.00

No. 4 Edson Pumping Outfit, weight 423 lbs., consisting of one No. 4 pump, 12 feet of 4-inch suction hose and all fittings named in No. 3 outfit, complete Price, \$85.00

GALVANIZED, SPIRAL RIVETED BILGE PUMPS

Soldered Joints—Spiral Riveted or Lock Seam Pipe



Length of Bilge Pumps is measurement over all.

Diameter, Inches	Length, Feet	Price, per Foot
2½	6 and 8	\$1.25
3	6, 8, 10 and 12	1.50
4	8	1.75

HORIZONTAL DOUBLE-ACTING SUCTION AND FORCE PUMPS**With Air Chambers, Brass Lined Cylinders and Adjustable Handles**

Valves, valve seats and piston rod are of bronze provided with drip-cocks for priming and to prevent freezing.

For ships, factories, cleaning and filling boilers, and for elevating water from cisterns to overhead tanks. The valves are easy of access by simply unscrewing the bolts and lifting off the air chamber without disturbing suction pipes. Pumps are mounted on planks and are all fitted for both iron pipe and hose.

"MONARCH" SINGLE LEVER PUMP

Fig. 275



Diam. Cylinder	Stroke	Suction Fitted for Pipe	Discharge Fitted for Pipe	Price
3 in.	5½ in.	1½ in.	1½ in.	\$27.00

"TIGER" SINGLE LEVER PUMP

Fig. 350



The air chamber can be reversed so that discharge may be used on either side.

Diam. Cylinder	Stroke	Suction	Discharge	Price
3 in.	4 in.	1½ in.	1¼ in.	\$21.00

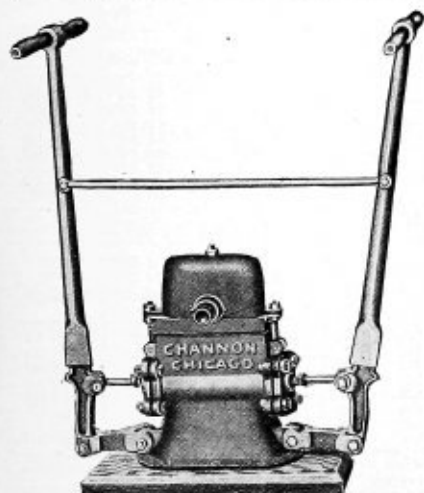
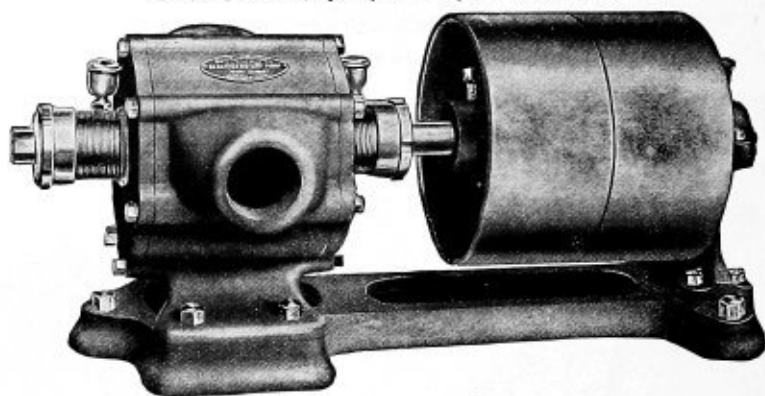
**"MONARCH" DOUBLE-LEVER DOUBLE-ACTING FORCE PUMP**

Fig. 276

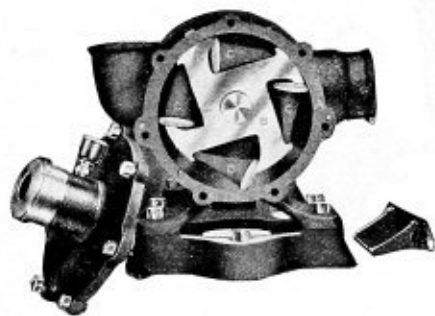
Diam. Cylinder	Length of Stroke	Suction Fitted for Pipe	Discharge Fitted for Pipe	Price Each
5 in.	6 in.	2½ in.	2 in.	\$45.00

Hose, pipe and connections always in stock

BLACKMER ROTARY PUMPS



No. 6 Low Pressure Pump



A—Cylinder. B—Piston. C—Buckets

Buckets drop into extension chamber (lower part of cylinder) at left and pass to the right, drawing liquid in at suction and pushing it out of discharge.

Takes up its own wear. Will stand long and hard usage. Requires no attention. No valves, springs or cams—not even a washer to replace.

The Blackmer Rotary Pump is positive-acting and close fitted and is made in two styles for both low pressure and high pressure service.

Low pressure pumps are designed for ordinary heads up to 50 feet and where the service required is not severe.

High pressure pumps are designed and constructed to meet demands requiring heads of more than 50 feet and also where service is especially hard.

LOW PRESSURE, SOLID

Number of Pump	Size of Cylinders, Inches	Pipe Connections	Size of Pulleys, Inches	Weight, Lbs.	Gallons per Min. P. M.	Revolutions per Minute	Gallons per Minute	Normal Speed	Floor Space, Inches	Prices	
										Iron	Bronze
1 Belt	1 1/2	3/4	4x	30	2 1/2	350 to 650	8 to 16	500	6 1/2 x 14	\$ 25.00	\$ 30.00
2 " "	2	1	4x	40	4	350 to 650	14 to 26	500	6 1/2 x 6	35.00	45.00
3 " "	3	1 1/2	6x	45	9	300 to 500	27 to 45	400	8 x 20	45.00	65.00
4 " "	4	1 1/2	6x	55	12 1/2	300 to 500	37 to 62	400	8 x 24	50.00	75.00
5 " "	5	2	9x	200	45	200 to 400	90 to 180	300	11 x 30	80.00	120.00
6 " "	6	3	12x	400	100	150 to 300	150 to 300	250	16 x 36	125.00	180.00
7 " "	7	4	20x	1400	175	125 to 250	220 to 440	200	22 x 68	300.00	On Appl.

HIGH PRESSURE, SOLID

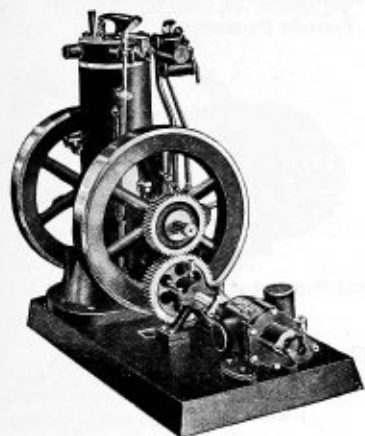
Number of Pump	Size of Cylinders, Inches	Pipe Connections	Size of Pulleys, Inches	Weight, Lbs.	Gallons per Min. P. M.	Revolutions per Minute	Gallons per Minute	Normal Speed	Floor Space, Inches	Prices	
										Iron	Bronze
1 Belt	1 1/2	3/4	4x	35	2 1/2	350 to 650	8 to 16	500	7x16	\$ 30.00	\$ 40.00
2 " "	2	1	4x	50	4	350 to 650	14 to 26	500	7x20	47.00	67.00
3 " "	3	1 1/2	6x	65	9	300 to 500	27 to 45	400	10x20	60.00	85.00
4 " "	4	1 1/2	6x	85	12 1/2	300 to 500	37 to 62	400	10x28	70.00	100.00
5 " "	5	2	9x	270	45	200 to 400	90 to 180	300	10x30	110.00	180.00
6 " "	6	3	12x	475	100	150 to 300	150 to 300	250	14x40	175.00	250.00
7 " "	7	4	20x	1500	175	125 to 250	220 to 440	200	22x68	Lined Only on Application	
8 " "	8	5	36x	2500	350	100 to 200	350 to 700	150	36x87		

The High Pressure Solid Pumps are made in Sizes No. 1 to No. 8 inclusive.

The High Pressure Lined Pumps are made in Sizes No. 3 to No. 12 inclusive. Price on Application.

The speeds, capacities and floor space of the Solid and Lined Pumps are the same.

BLACKMER GASOLINE PUMPING UNITS



Engine H. P.	Pump No.	Head	Friction Loss, Lbs.	Gallons per Minute	Gallons per Hour	Price, Including Pump, Base and Gear
2	H. P. 2	150	31	20	1,200	\$100.00
	H. P. 3	100	9	35	2,100	116.00
	H. P. 4	75	4	50	3,000	130.00
	L. P. 6	37.5	15	100	6,000	140.00
3	H. P. 3	150	9	35	2,100	130.00
	H. P. 4	100	5	50	3,000	140.00
	L. P. 6	50	3	100	6,000	150.00
	L. P. 8	25	2	200	12,000	197.00
4½	H. P. 4	150	4	50	3,000	150.00
	H. P. 6	100	2	75	4,500	190.00
	L. P. 6	75	4	100	6,000	160.00
	L. P. 8	37	5	200	12,000	204.00
6	H. P. 6	150	4	75	4,500	200.00
	H. P. 6	100	4	100	6,000	200.00
	L. P. 8	50	2	200	12,000	218.00
	H. P. 8	...	...	...	...	268.00

DOUBLE PUMPING UNIT WITH GASOLINE ENGINE

The Double Pumping Unit has a capacity of 100 gallons each per minute against a 25-foot head and consists of two No. 6 low-pressure iron pumps, mounted on a heavy cast iron sub-base and direct-connected by means of a friction clutch on each shaft to a large cast iron cut gear which meshes with a cast iron cut center pinion keyed to the shaft of a 3-horse-power gasoline engine.

This arrangement permits of both pumps being used at the same time and being thrown in or out of service independent of each other.

On account of the varying conditions under which these machines may be operated, and on account of the variety of sizes, and to suit these conditions, it is not possible to show list prices.

We will gladly quote upon receipt of the following information:

(Bronze or Iron) Pump

To be used for pumping

Vertical length of suction

Horizontal length of suction, if any

Extreme height to which liquid is to be pumped

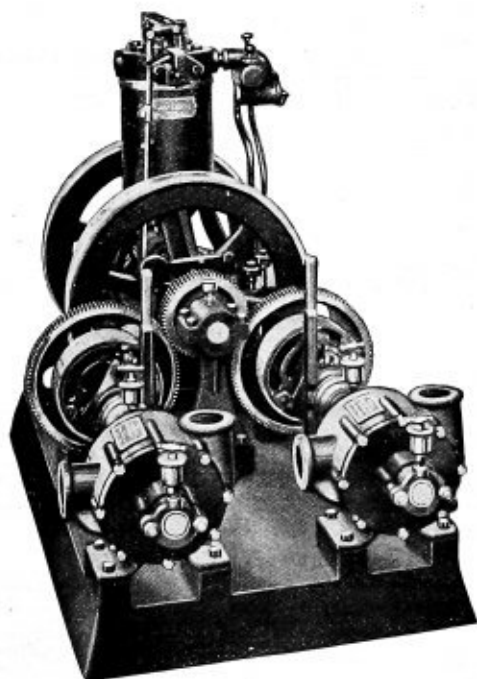
Length of discharge pipe

Size of suction pipe.....Size of discharge pipe.....

Quantity of liquid to be pumped:gallons per minute.....per hour.....

What is the liquid to be pumped?.....Temperature.....Is liquid alkaline?.....Is liquid acidulous?.....

Does it contain solid matter?.....Does it contain gritty matter?.....



POWER ROTARY FORCE PUMPS

On Frames with Tight and Loose Pulleys
100 Pounds Pressure

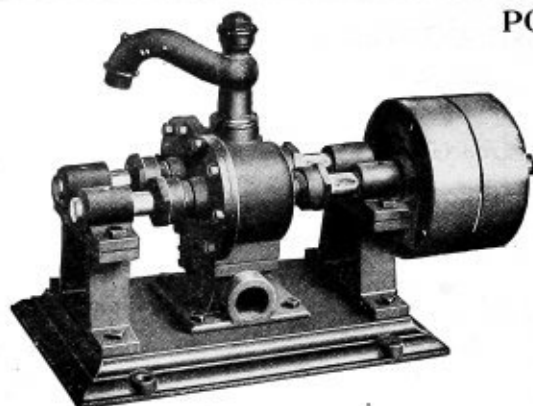


Fig. 121

This is a low priced and useful pump, very compact, with loose pulleys, and four babbitted box bearings, supported by hangers bolted to bed plate. This arrangement produces a very efficient and durable pump, holding the cams in perfect alignment.

Used largely by creameries, refineries, breweries, and factories. It pumps a steady stream and in emergencies can be used as a fire pump, throwing water about 75 to 100 feet horizontally.

For discharge to tank, the cap, as shown in cut, on upper discharge, should be placed on end of spout. For pumping acids, bronze pumps should be used, and when intended for hot liquids, they should have metallic check valves.

Drip plugs are provided for draining pumps in cold weather. Suction at bottom or either side.



Internal Section of Rotary Pump

No.	Capacity per Minute at 100 R.P.M.	Suction Fitted For	Discharge Fitted For	Size Tight and Loose Pulleys	Iron, Price, Each	Bronze, Price, Each
1	13 Gals.	1 1/4 inch pipe	1 inch pipe	7 x 2 1/2 inches	\$34.50	\$ 54.65
2	14 "	1 1/4 " "	1 " "	7 x 2 1/2 "	39.50	61.65
3	17 "	1 1/2 " "	1 1/4 " "	7 x 2 1/2 "	45.50	68.65
4	27 "	1 1/2 - 2 " "	1 1/2 " "	11 x 3 "	63.25	88.00
5	36 "	2 - 2 1/2 - 3 " "	2 " "	11 x 3 "	69.25	100.00

LARGE ROTARY PUMPS

100 lbs. Pressure

A powerful force pump for tank service, fire protection, etc. Has two pairs of heavy gears to relieve the cams; babbitted boxes. Vacuum chamber, into which the suction pipe screws, is cast in the frame.

The ends of the teeth in cams that come in contact with the case are packed by bronze blocks inserted into grooves and pressed out by springs, thus insuring perfect vacuum and the taking up of wear.

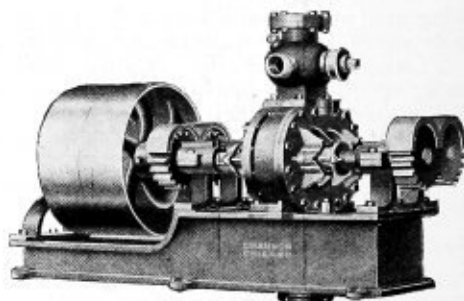


Fig. 198

No.	Speed R.P.M.	Capacity Gallons per Minute	Suction and Discharge	Size of Pulleys	Price, Iron	Price With Bronze Case and Cams	Price, Bronze
10	100 to 250	29 to 72	2 inches	14 x 4 1/2 inches	\$115.00	\$155.00	\$ 185.00
20	"	43 " 108	2 1/2 "	16 x 5 1/2 "	130.00	195.00	245.00
30	"	87 " 218	3 "	18 x 6 1/2 "	185.00	305.00	405.00
40	100 to 200	168 " 315	4 "	20 x 8 1/2 "	275.00	475.00	650.00
50	"	270 " 540	6 "	24 x 8 "	350.00	600.00	900.00
60	75 to 150	342 " 685	8 "	28 x 9 "	550.00	950.00	1,450.00

All parts coming in contact with liquid are bronze.

ROTARY FORCE PUMP

With Light Balance Wheel for Hand Use



Fig. 118

Used without the base for priming centrifugal pumps.

Will pump hot water by the addition of a metallic lower valve.

For wine or liquor a bronze pump should always be used, as it is unaffected by the action of acids.

No.	Suction, inches	Discharge, inches	Diameter Balance Wheel, inches	Gallons per Min. 100 Rev.	Price Iron	Price Bronze
1	1 1/4	1	14 1/2	13	\$19.00	\$41.00
2	1 1/4	1	14 1/2	14	22.00	46.00
3	1 1/2	1 1/4	14 1/2	17	26.00	51.00



Fig. 115

DOUBLE-ACTING OSCILLATING FORCE PUMP

Sometimes called "Clock" Pump. Furnished with brass wing piston, brass valves and valve box.

The lever may be worked from either a vertical or horizontal position.

These wing-valve pumps having no leather packings are suited for hot liquids, oil, wine, cider, etc.



Fig. 375

No.	Gals. per Min.	Inside Diameter Cylinder	Suction and Discharge Flanges Fitted For	Iron, Brass Fitted	*Brass
0	4	4 1/8	1/2 in. pipe	\$ 8.00	\$16.00
1	5	4 3/4	3/4 "	9.50	20.00
2	6	5 5/8	1 "	11.00	27.50
3	9	6 3/8	1 1/4 "	13.00	35.00
4	13	7 1/4	1 1/2 "	16.00	42.50
5	19	8 3/8	2 "	20.00	50.00
6	22	9 1/8	2 1/2 "	23.50	60.00
7	26	10 3/8	3 "	27.50	70.00
8	36	11 3/4	4 "	40.00	90.00

* All brass, except lever suction discharge flanges.

HAND ROTARY BARREL PUMP

With Improved Barrel Attachment

Fitted with new device for holding suction pipe rigid in the bung of barrel having any size of bung from 1 1/2 to 4 inches in diameter.

With this outfit fluids can be pumped from barrel or hogshead and forced into a tank or reservoir some distance away.

Price includes 3 feet of suction pipe, hose coupling, hook and holder.

Fig. 115

No.	Gallons per Minute	Suction Pipe	Discharge for Hose	Iron, Price
1	13	1 inch	1 inch	\$17.00
2	14	1 "	1 "	20.00
3	17	1 1/4 "	1 1/4 "	24.00

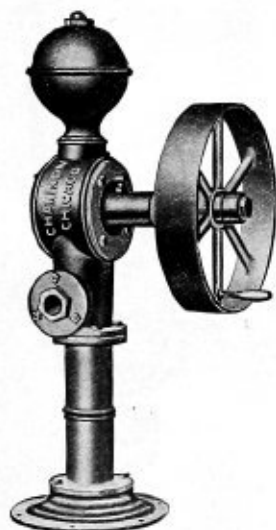
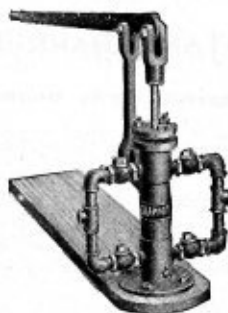


Fig. 230
For Hand or Power

It can be used in deep wells in connection with cylinders, and will be fitted for attaching deep-well cylinders when so ordered.

No.	Cylinder, Inches	Stroke, Inches	Suction, Inches	Disch'ge, Inches	Pulley	Price
Fig. 230	3	5	1 1/2	1 1/2	16x3	\$25.00
" 231	3	5	1 1/2	1 1/2	16x3	30.00

BOILER TEST-PUMP Hand-Power, Bronze Fitted



This is a substantial double-acting pump, capable of being worked by one man against 500 pounds pressure. It has brass piston (packed), brass piston rod and forged connections.

Piston 2 inches in diameter.
Length of stroke, 5 inches.
Suction for 1-inch pipe.
Discharge for 3/4-inch pipe.
Weight, 60 pounds.

Repacking or cleaning out is conveniently done by simply unbolting and lifting the pump off its base.

Price\$50.00

HAND AND POWER PISTON PUMPS

**With Air Chamber
and Crank-Shaft**

Fig. 230 is fitted with single pulley, with handle, and can be used for hand or power.

Fig. 231 is fitted with tight and loose pulleys, and can be used for power only.

For raising water from wells and cisterns by hand or power and forcing it into tanks, etc.

The pump is constructed with cylinder in barrel, the plunger being operated by a crank-shaft and pitman, which are enclosed below the air chamber.



Fig. 451

PEERLESS DEEP WELL FORCE PUMPS DOUBLE ACTING

**Adapted for Wells from 25
to 125 ft. deep**

**Can be changed to a shallow
well pump by simply re-
moving two bushings.**

The differential cylinders and the long pipe air chamber cause the discharge of a continuous stream from the spout; no splashing. Pump will always be primed if lower cylinder is set in the water.

The lower or deep well cylinders are made of seamless brass tubing. The 2 1/2-inch pumps (No. 2) should be used in wells 100 feet deep, the 3-inch pumps (No. 4) in wells 60 feet deep, and the 3 1/2-inch pumps (No. 6) in wells 40 feet deep; or less than depth mentioned.

Sizes and Prices

No.	Diameter Lower Cylinder	Fitted for Pipe	Stroke	Diameter of Drilled Well will go in	Fig. 281, Hand Top	Fig. 451 Windmill Top
2	2 1/2	1 1/2	6	5 5/8	\$15.00	\$16.00
4	3	1 1/2	6	5 5/8	15.00	16.00
6	3 1/2	1 1/2	6	6 5/8	17.00	18.00

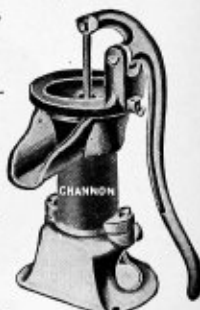
Price includes Strainer and Hose Attachment.

CLOSED-TOP PITCHER-SPOUT PUMP

Long lever, revolving closed top, secured by set screw. Cylinder with open spout. High bolted base fitted for iron or lead pipe, as ordered. Stroke No. 5 is 5 inches, No. 4-4 1/2 inches, balance 4 inches.

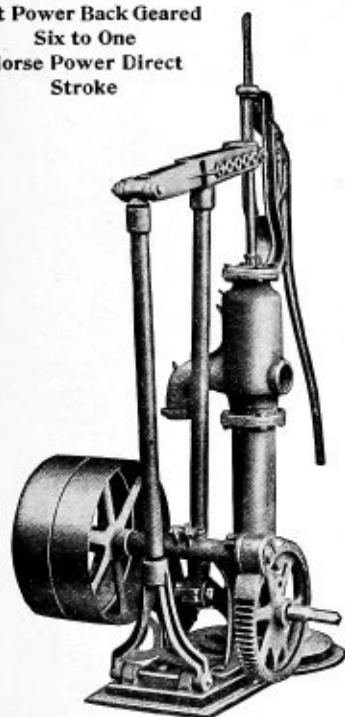
Sizes and Prices

Number	Diameter Cylinder	Suction Fitted for Pipe	Weight, Lbs.	Iron, Price	Brass Lined Cylinder, Price
1	2 1/2	1 1/4	12.0	\$4.25	\$ 6.50
2	2 1/2	1 1/4	12.0	4.75	7.25
3	2 1/2	1 1/4	12.0	5.25	8.00
4	2 1/2	1 1/4	12.0	5.75	9.00
5	4 1/2	1 1/2	12.0	9.50	12.50



COMBINATION PUMPING JACK AND TUBULAR
WELL STAND COMPLETE

Adjustable Stroke 6 to 10 1-2 Inches

Belt Power Back Geared
Six to One
Horse Power Direct
Stroke

The entire outfit is mounted substantially on a heavy iron base and makes a most complete outfit for use with belt power, horse power, wind-mill or hand power.

It is fitted with drop forged crank shaft, turned and mounted in split babbitted boxes. Has a walking beam with 10½-inch stroke. When driven by horse power it has a direct stroke. The balance wheel which connects to main crank shaft by means of pinions, serves to carry the pitman over the dead point at a regular movement, and prevents the rebounding of the horse power lever. When fitted for belt power, it is back geared six to one; for horse power one knuckle coupling is furnished.

The pump stand has a back outlet fitted for 2½-inch pipe.

No. 368, for horse power.....\$55.00 each
No. 369, for belt power..... 55.00 each

THE "CZAR"
NEW MODEL
IMPROVED
DOUBLE-ACTING
TANK PUMP

Fig. 605

A double-acting, powerful pump for heavy service. Spout and hose couplings are put on with a nut having a handle which does away with a wrench. The nut on the hose coupling is equipped with lugs which make it very easy to remove. Fitted for iron pipe and hose. The valves are easily accessible through port or hand holes, which are closed with plugs. The port hole caps over the valves are fitted with bolts, so that there are no threads to rust, jam or wear out.

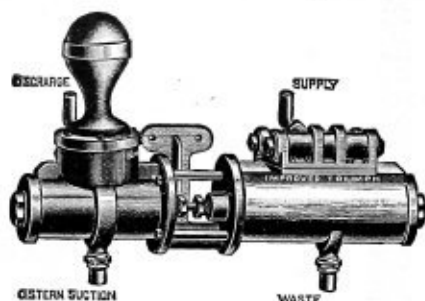
Diameter Cylinder	Stroke	Suction Fitted for	Discharge Fitted for	Price Pump only
5 inches	5 inches	2-inch hose and pipe	1-inch hose or 1-in. pipe	\$25.00

Outfit 1X—Pump with 15 feet 2-inch Spiral Suction Hose, 12½ feet 1-inch Discharge Hose, Couplings and Nozzle, complete.....\$45.00

Outfit 2X—Pump with 20 feet 2-inch Spiral Suction Hose, 12½ feet 1-inch Discharge Hose, Couplings and Nozzle, complete.....\$50.00

Outfit 3X—Pump with 25 feet 2-inch Spiral Suction Hose, 12½ feet 1-inch Discharge Hose, Couplings and Nozzle complete.....\$55.00
Strainer, extra 2.50

THE TRIUMPH AUTOMATIC WATER LIFT



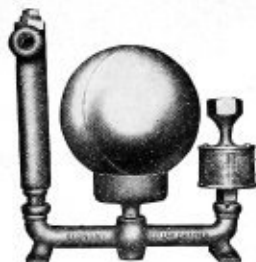
Designed to pump filtered or rain water from a cistern, direct into the house pipes and plumbing fixtures or into an attic storage tank.

Operated by hydraulic pressure, that is by the pressure or force of the city water.

Made of bronze, is simple and noiseless in operation. It needs no oil, the wearing parts being leather against metal. Its working parts are few and easy of access. It can be used for direct pumping, or for pumping to a tank.

No.	Price	CYLINDERS		Stroke, Inches	Weight, Lbs.	Adapted for City Pressures	EXTREME CAPACITIES			
		Power	Suction				Press. Lbs.	Gals. Per Hour	City Water used per Hr	Extreme Lift with 15 ft. Suction Lift
1	\$55.00	2½	2	5	37	25 to 40	40	160	240 gal.	120 ft.
2	55.00	2½	2½	5	38	40 " 60	60	200	200 "	120 "
3	55.00	3	2½	5	38	20 " 35	35	200	280 "	100 "
4	55.00	3	2	5	38	15 " 25	25	130	275 "	100 "
5	60.00	2½	3	5	40	60 or more	60	275	185 "	80 "
6	60.00	3	3	5	41	40 to 60	60	275	275 "	120 "
8	60.00	4½	3	5	55	15 " 25	25	220	460 "	100 "

PERFECTION AUTOMATIC CELLAR DRAINER



Operates by water or steam pressure.

Will elevate its given capacity of water one foot high with each 5 lbs. of city water pressure.

Note.—When information is desired or order is given, please state the estimated water or steam pressure, and height from bottom of drainer pit to point where water is to be discharged. Plan to make the distance as short as possible.

Dimensions, Capacity and Price List

Number	PIPE CONNECTIONS		Gals. Discharged Per Hour	Weight	Price
	Inlet	Discharge			
1	¾ in.	1 in.	400	19 lbs.	\$20.00
2	¾ "	1½ "	800	22 "	25.00
3	1 "	2 "	1500	28 "	30.00

Dimensions: 18 in. long, 12 in. wide, 20 in. high.

HAND CISTERN FORCE PUMP

With Spout and Clevis

Arranged to take place of pitcher spout cistern pumps and large house pumps.

Tapped in back for elevating water into tanks.

Fitted for attaching either lead or gas pipe.

Can also be furnished with Faucet Spout.



Fig. 21

Fig. 21—3-inch bore for 1¼-inch pipe\$7.00

Fig. 23—Same with faucet spout 9.50

CENTURY SPRAY PUMP WITH COG GEAR HANDLE

2 1-2 inch Removable Brass Cylinder, Concave Brass Seats, Brass Poppet Valves, Hemp Packed Plunger for Hot or Cold Mixtures.
Suitable for one, two or three leads of hose.



The cylinder is lined with a seamless drawn brass tube, flanged out at either end, and faced off flush with the cylinder head, permitting the easy access of the plunger when removed for repairs. The lining is not only held in position by the flange, but also by the cylinder head proper, which is bolted securely against it, preventing its moving when under heavy pressure.

The Valves are brass, of the poppet pattern, with concave brass seats. Each valve is located under an individual cap, and can be removed without disturbing any of the other parts.

The base is separate and bolted securely to the pump body.

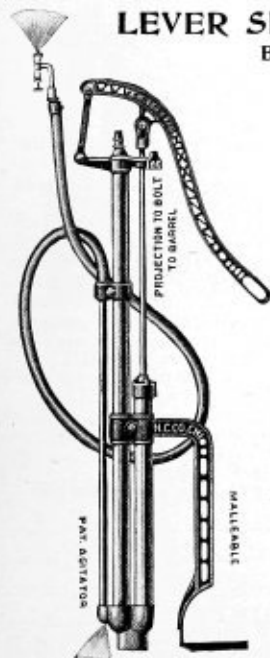
The handle is the cog gear pattern. The application of the cog gear to the pump handle increases the leverage about 40 per cent over the old style handle movement.

The piston rod is brass; the handle of tubular steel.

One special feature of this pump is that it has a valve located between the air chamber and the pump, which retains the pressure of the air chamber on the nozzles, and relieves the valves of the pump from all strain.

PRICES

Century Spray Pump, with strainer and pressure gauge.....	\$30.00
Discharge Hose.....	.25 per foot
Six feet of wire-bound Suction Hose complete.....	.60 " "

LEVER SPRAY PUMP
BRASS

No. 324A

Used with Bucket, or can be attached to top of barrel.

1 1/4-inch Cylinder.

Patent Agitator.

Ball Valves.

Malleable Handle and Foot Rest.

Work all done on down stroke.

PRICE

No. 324A. Pump, with Agitator, Hose, graduating Vermorel Spray Nozzle and one 8-foot pipe extension.

\$6.50

VERMOREL SPRAY NOZZLES



Regular, Fig. 552



Graduating, Fig. 763

Produce a perfect mist of fine spray at low pressure, spraying a large area with small quantity of liquid.

Fig. 552 has spring degorger or cleaner, which operates by pressing against the limb of tree.

Fig. 763 has degorger operated by screw plunger and spray can be graduated from a fine mist up to a solid spray.

Fig. 552. Regular, fitted for 1/4-inch pipe.....	Each \$1.00
Fig. 552. " " 3/4-inch hose.....	1.25
Fig. 763. Graduating, " " 1/4-inch pipe.....	1.00
Fig. 763. " " 3/4-inch hose.....	1.25

THE "BULLDOZER" DOUBLE-ACTING POWER PUMPS

Double Gearing, Adjustable Stroke, Brass Lined Cylinders, Brass Covered Pistons, Split Babbitted Boxes, Brass Valve Seats, Hard Rubber Valves, Brass Valve Springs. For Hot or Cold Water.

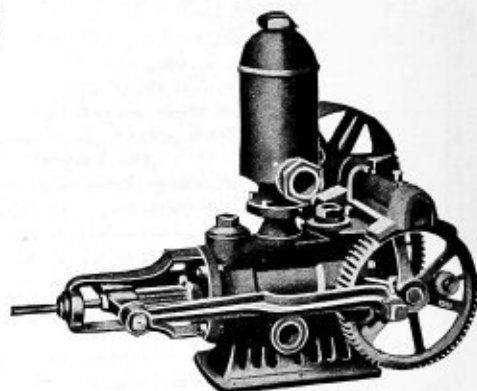
Will elevate water 125 to 200 feet perpendicularly, or equivalent pressures when properly piped and not restricted.

Adapted to meet the requirements for a compact power pump, to be operated with a gas or gasoline engine, electric motor or any belt power.

The pump is constructed so that the working parts line with the bore of the cylinder, which is utilized as the main frame and the bed plate of the pump, and is made with base which carries the entire construction.

No. 371 has brass valves; balance have hard rubber.

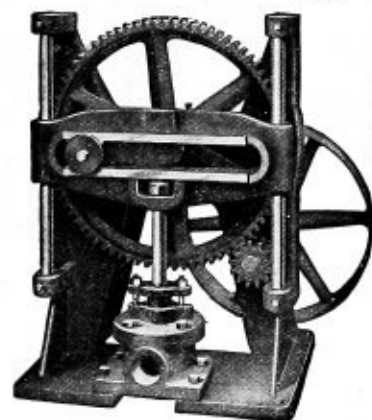
All back geared 6 to 1, except No. 363—8 to 1.



Cut of No. 353

No.	Price	Size		Maximum Capacity Gallons per Hour	Suction and Discharge	Speed R. P. M.	Tight and Loose Pulleys	Vertical Elevation, Feet	HORSE POWER REQUIRED				
		Diam. Cyl.	Stroke Adjustable to						Elevation in Feet				
371	\$ 65.00	3	5 in.	900	1½ in.	50	16x4	200	5½	¾	¾	1	1¼
362	75.00	3	5-7½-10	1400	2 "	40	16x4	150	¾	¾	1	1¼	1½
351	120.00	4	5-7½-10	2100	2 "	40	24x4	150	¾	1	1¼	1½	2
353	75.00	5	5	2000	2 "	30 to 40	16x4	125	¾	1	1¼	1½	2
352	150.00	6	10	5800	3 "	40	24x4	150	1¼	2	3	4	5
363	250.00	6	12-16-20	7200	4 "	25	30x6	150	4	5	6	7	9

THE ALLRITE PUMPING HEAD



The Allrite Pumping Head will handle a four-inch cylinder seventy feet, or less in the well, or a two-and-one-half-inch cylinder one hundred and seventy feet in the well. Places between these points should have a suitable size cylinder.

To the base plate of the frame is attached the pipe head, which is tapped for pipe to well cylinder and delivery pipe. Smaller well pipe can be used by bushing the head. The delivery pipe should have a swing check valve near head to hold water up. When not used to the limit, the pumping head will also elevate to a moderate height. The pipe head is made in two parts to allow top piece to be taken off to remove the plunger when full sized pipe is used on shallow wells.

Dimensions

Stroke 12 inches—Geared 6 to 1.
Pulley 18 inches for 4-inch belt.
Pipe head tapped for 4-inch pipe with 2-inch discharge.
Floor space 22 inches x 23 inches, height 30 inches, weight 400 lbs.

Price \$70.00

Capacity and Horse Power

Size of Cylinder, inches	2½	3	3½	4
Capacity per hour at 40 strokes per minute.....	600 Gal.	800 Gal.	1200 Gal.	1500 Gal.
Horse power required for 100 feet elevation.....	½ H. P.	¾ H. P.	¾ H. P.	1 H. P.

CHANNON POWER PUMPS

For Light Service

For pressure
up to 50 pounds.
Speeds 10 to 70
strokes per minute.

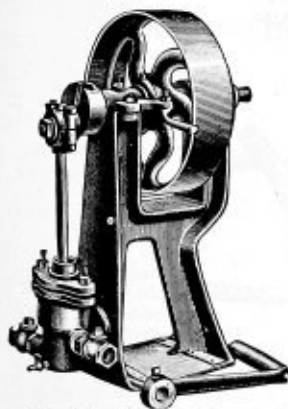


Fig. 81. Single Plunger

The above pumps are designed for any light service, such as filling tanks or any place where pressure does not exceed 50 lbs. per square inch. Plungers are cast iron, valves of bronze. Pumps can be run either way and valves can be changed to make either side suction or discharge side.

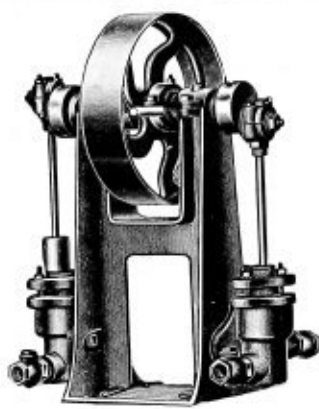


Fig. 82. Double Plunger

No.	Diam. Plunger, Inches	Length stroke, Inches	Suction and Discharge Inches	Size Pulley	Price Single Plunger	Price Double Plunger	CAPACITY AT 40 STROKES PER MINUTE			
							SINGLE PLUNGER		DOUBLE PLUNGER	
							Gals., per Hour	Boiler H. P.	Gals., per Hour	Boiler H. P.
1	2	4	1	16x3 $\frac{3}{4}$	\$40.00	\$45.00	124	31	248	42
2	2 $\frac{1}{2}$	4	1 $\frac{1}{4}$	16x3 $\frac{3}{4}$	45.00	50.00	204	51	408	102
3	3	4	1 $\frac{1}{2}$	16x4 $\frac{1}{4}$	55.00	60.00	293	73	587	147

CHANNON No. 4 GEARED POWER PUMP

For pressures
up to 170 lbs.
Speeds 10 to 60 strokes
per minute.

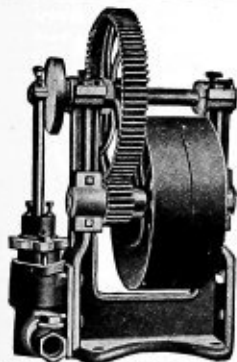


Fig. 91. Single Plunger

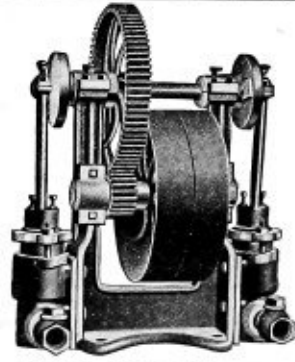


Fig. 92. Double Plunger

Designed for continuous hard work, such as feeding boilers or in paper mills, tanneries or any place where a good, reliable pump is required.

The valves can be changed to suit the relative position of pipes or boiler and pump can be run in either direction. Can be run as a double pump or two distinct and separate single pumps. Have brass plungers and valve seats and bronze or hard rubber valves. In boiler feeding will save about 50 per cent. over an injector and 25 per cent. over a steam pump.

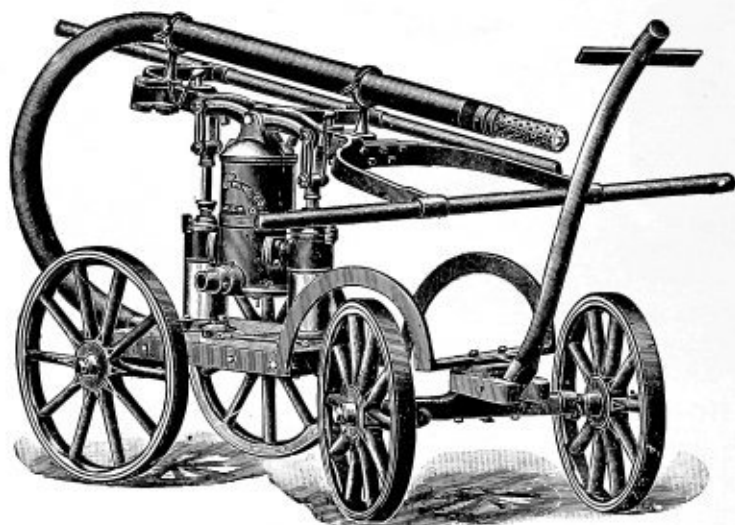
No.	Diameter Plunger	Length Stroke	Geared	T. & L. Pulleys	Suction	Discharge	Price Single	Price Double
4	3 in.	4 in.	4 to 1	16x3 $\frac{3}{4}$	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	\$80.00	\$100.00

Capacity, Allowing 4 Gallons per H. P. per Hour

Strokes per Minute	10	20	25	30	35	40	45	50	55	60
Single Plunger—gallons per Hour . .	73	147	183	220	257	294	330	367	403	450
—Boiler H. P.	18	37	46	55	64	74	83	92	101	112
Double Plunger—Gallons per Hour . .	146	293	366	440	513	587	660	733	806	880
—Boiler H. P.	36	73	91	110	128	147	165	183	201	220

SWAN-NECK VILLAGE FIRE ENGINE

With Gun-Metal Cylinders



The accompanying illustration represents our Swan Neck Village Fire Engine, a mounted Fire Pump. It has only to be seen to command the attention and appreciation of thousands of people that live in Villages and Towns where there is no fire protection. With this Fire Pump we can furnish a town where there is no regular system of water-works, better and cheaper fire protection than with any other class of fire apparatus, and we give the reasons why we can do so, as follows:

It is a powerful Pump.

It is substantially mounted on a carriage combining strength, durability and the least possible weight.

It can be moved from one location to another with but from one to four men.

It can be moved over the street sidewalks when in wet weather and muddy roads it would be impossible to move a heavy hand engine or a steam fire engine.

It can be operated to its maximum capacity with from six to ten men.

It is better than a steamer for small towns and villages, as it can be easily moved to a fire, in good or bad weather.

It will subdue an incipient fire just as easily as a heavier or more cumbersome machine.

It can be taken through ordinary gates, into back yards, and narrow alleys.

It will lift water from a well or cistern 25 feet deep and discharge the water through any length of hose desired.

It will throw water from 60 to 90 feet horizontally, and from 50 to 70 feet perpendicularly.

The extreme distance, however, that it will throw water is not material for protection. To put out fires, city fire departments do not depend on distance that an engine will throw, but on hose, carrying the nozzle as close to the flames as possible, and delivering the greatest quantity of water possible on the flames.

A sprinkling of water from the end of a 75 to a 100-foot stream only creates gas that aggravates the flames. Use hose, and get the water to the flames.

The best fire department authorities in the United States claim that for small towns and villages such an outfit as we furnish is of incomparably more value than any other class of apparatus.

SIZES AND PRICES

No.	Size Cylinders	Suction Fitted For	Discharge Fitted For	Stroke	Capacity per Revolution	Price Without Hose, Etc.
4	4½-inch.	2½-inch Hose.	1½-inch Hose.	6-inch.	.83 gal.	\$250.00
5	6 "	3 " "	2 " "	8 "	1.96 "	350.00

A complete outfit consists of pump and 25 feet of suction hose with couplings and strainer, and from 100 to 500 feet rubber lined cotton fire hose with automatic couplings and screw tip nozzle.

For Hose, Couplings and Nozzles see Index

THE "AMERICAN" DEEP WELL STEAM PUMP HEAD

Used in city water works, and by factories, railroads, mines, etc.

Fig. 884A illustrates the Steam Pump Head used in conjunction with our double-acting water cylinders. It can be driven by steam or compressed air.

It is placed over the well on brick, stone, concrete or timber foundation. The column or discharge pipe which sustains the water cylinder in the well is screwed into the tee shown at base of pump head and the weight of this discharge pipe holds the pump head in place. The surface discharge pipe leading from pump head into tank, stand pipe or pressure main is screwed into the side opening shown in tee at base. This opening may be turned to other side, or to either end of base as desired. If water is to be forced to any distance above ground, either horizontally or directly into pressure main, a check valve and air chamber should be placed in discharge pipe close to pump head. Where largest quantity of water and long life of plant and economy of steam is desired, use the 36-inch stroke.

Steam Chest is fitted with patent balanced steam piston valve, which in turn is operated by Auxiliary Valve preventing short stroking or stopping on center, resulting in economy of steam. Piston cannot strike heads as valve encloses a part of the exhaust steam in steam cylinder at end of each stroke. Steam Piston is fitted with two self-adjusting spring packing rings preventing waste of steam past piston. Steam Cylinder is wood lagged, covered with Russia iron secured with brass bands preventing condensation of steam in cylinder. Regulation of stroke is accomplished by throttle valves. The Frame or Legs supporting the cylinder are of the Circular Pattern, giving extreme rigidity and symmetrical design; can readily be swung back to one side on base, when re-leathering valves. The Base is extra large and heavily ribbed for greatest strength. All parts are machined to template and jigs, making same interchangeable.

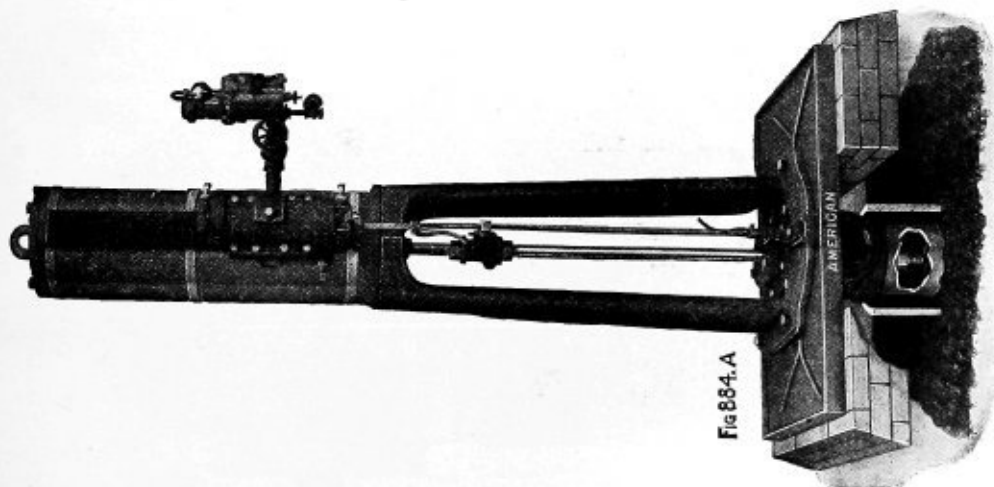
Furnished: Steam Head only, complete with Sight Feed Lubricator and Pipe Fittings shown.

Dimensions Fig. 884-A Steam Pump Heads

No.	STEAM CYLINDER		WATER PIPES*		STEAM PIPE		Apex Weight, Lbs.	Price
	Diam., Inch.	Stroke, Inch.	Well, Inch.	Disch., Inch.	Steam, Inch.	Exhaust, Inch.		
4	5	24	4 $\frac{1}{2}$	3	3 $\frac{1}{4}$	1	655	\$129.00
5	6	24	5	3 $\frac{1}{2}$	1	1 $\frac{1}{4}$	820	138.00
6	6	36	5	3 $\frac{1}{2}$	1	1 $\frac{1}{4}$	950	173.00
7	8	24	6	4	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1150	207.00
8	8	36	6	4	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1300	218.00
10	10	36	8	6	1 $\frac{1}{2}$	2	1550	248.00
12	12	36	8	6	2	2 $\frac{1}{2}$	2280	330.00
13	14	36	10	7	2 $\frac{1}{2}$	3	2600	446.00
14	16	36	12	8	3	3 $\frac{1}{2}$	3000	563.00

Size special hollow iron rods to suit diameter, cylinder and lift.

*If smaller wanted bush openings. No. 12 made for 10 and 7-inch if desired.



DOUBLE-ACTING WATER CYLINDERS

Double the Quantity of Water from a Deep Well with the Same or Smaller Pump Head, by Using the "American" Double-Acting, Double-Quantity, Water Cylinder

Fig. 380-A illustrates All Brass Removable Valve Type Cylinder, in which valves are of smaller diameter than the inside diameter of column or discharge pipe. When new leathers are needed it is only necessary to pull out the plunger rods, to have all valves come up. This without disturbing column or discharge pipe.

It discharges the full capacity of the cylinder on the down stroke as well as on the up stroke, therefore it is not only Double-Acting, but actually gives *double quantity*.

All other so-called double-acting cylinders only give, by actual measurement, the same quantity as a single-acting, but they do deliver a part of this quantity on the down stroke, which would naturally deceive unless the quantity were actually measured.

The Cylinder (I) and Plunger Rods (G) and (H) are of X heavy seamless drawn brass tubing. All other metal parts are of cast brass, including top and bottom couplings into which suction and discharge pipes are screwed. The valves S1 and S2 and D1 are extra heavy and of best quality rubber. The Ball Valve D2 is of brass. The Plunger J is packed with Cup Leathers as at L; the hollow rods G and H where they travel through the valve seats are packed with special Flanged Leather as at K and K1; this prevents leakage of water around the rods and is very essential.

Dimensions and Data Fig. 380-A Double-Acting Brass Cylinder

Inside Diameter, Cylinder, Inches	Maximum Stroke, Inches	Capacity when Plunger Travels 100 up feet per Minute		Top Threaded for Pipe, Inches	Smallest Diam. Cylinder will Enter, Inches	Price Each
		Gals. per Min.	Gals. per Hour			
3 1/4	24	75	4,500	3 1/2	4 1/2	\$ 117.00
3 1/2	36	75	4,500	3 1/2	4 1/2	131.00
4 1/4	24	128	7,680	4 1/2	6	140.00
4 1/4	36	128	7,680	4 1/2	6	165.00
5 1/4	24	243	14,580	6	8	255.00
5 1/4	36	243	14,580	6	8	270.00
6 1/2	24	300	18,000	7	9	360.00
6 1/2	36	300	18,000	7	9	420.00
7 1/2	24	400	24,000	8	10	540.00
7 1/2	36	400	24,000	8	10	600.00
8 1/2	24	515	30,900	9	12	750.00
8 1/2	36	515	30,900	9	12	825.00
9 1/2	24	644	38,640	10	13	900.00
9 1/2	36	644	38,640	10	13	1,013.00
11 1/2	24	943	56,580	12	15	1,320.00
11 1/2	36	943	56,580	12	15	1,455.00

When from long service or gritty water, the packing becomes worn and does not give its full quantity of water, new leather packings may be put on, making it as good as new. This is not possible where no provision is made for leather packing.

OPERATION

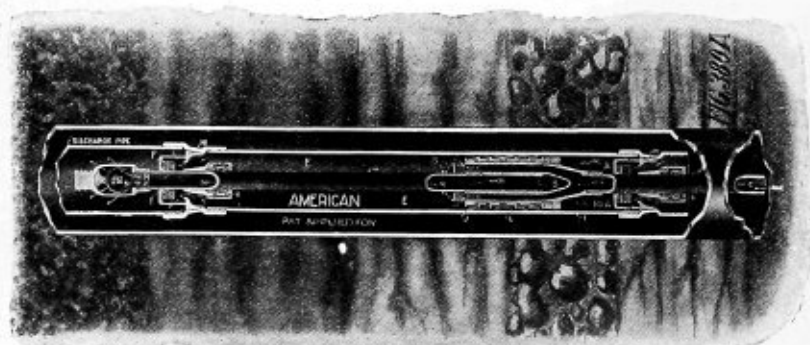
On the Up Stroke, Suction Valve S1 opens and space A below the plunger is filled. At the same time, the discharge valve D1 opens and water in space E above the plunger is forced up into discharge pipe F.

On the Down Stroke, Valves S1 and D1 close, and suction valve S2 opens and water is drawn through hollow rod H (as indicated by arrow C) and fills space E. At the same time the Ball Discharge Valve D2 opens and the water in space A below the plunger is forced up through the hollow rod C (as indicated by arrows M1 and M2) into the discharge pipe F.

It will give twice as much water as any other water cylinder of same diameter and stroke when run at the same number of strokes per minute.

It may be used with Belt Driven or Steam Pump Heads.

If water is obtained in caving materials, have well completed with screen before putting in pump.



THE "AMERICAN" BELT DRIVEN, DEEP WELL PUMP HEAD *

Used in city water works, and by factories, railroads, mines, etc.

Fig. 110A illustrates the Double Geared, Belt Driven Pump Head used in conjunction with double-acting water cylinders.

It may be driven by any power—steam, gas, or gasoline engine, electric motor or from a line shaft. When so ordered we will connect directly to electric motor by gear or "Silent Chain," thus eliminating belts, pulleys, etc.

It is placed over the well on brick, stone, concrete or timber foundation. The column or discharge pipe, which sustains the water cylinder in the well, is screwed into the tee shown at base of pump head and is held in place by the weight of this pipe and by bolts in the foundation.

The surface discharge pipe leading from pump head into tank, stand pipe or pressure mains is screwed into the side opening shown in tee at base. This opening may be turned to other side or to either end of base as desired. If water is to be forced 20 feet or more above ground, or horizontally 50 feet or more or directly into pressure mains, a check valve and air chamber should be placed in discharge pipe, close to pump head.

It is extremely heavy and rigid in all parts to meet the requirements of heavy lifts on deep wells and large volumes of water.

The Frame is cast with ribs to give it stiffness.

The Bearing Boxes on frame, as well as the crank and wrist-pin boxes and the guide, through which the plunger rod travels, are all of extra large proportions, lined with best quality "Babbit" metal, and are easily kept lubricated and run cool on maximum load.

The Crank and Crank Shaft are all in one piece and of steel.

It has Machine Cut Gears and Pinions on each side of crank to prevent twisting of crank. It has heavy counter-balance in each of the large gears to counteract the weight of pump, crank, rods, etc.

It has a heavy Balance Wheel to cause a continuous, steady motion of the moving parts.

The Base is extra long and machined on top so that when it is desired to pull the rods or pipe out of the well, the frame can be pushed back on the base.

It has Tight and Loose Pulleys so it can be stopped or started at will.

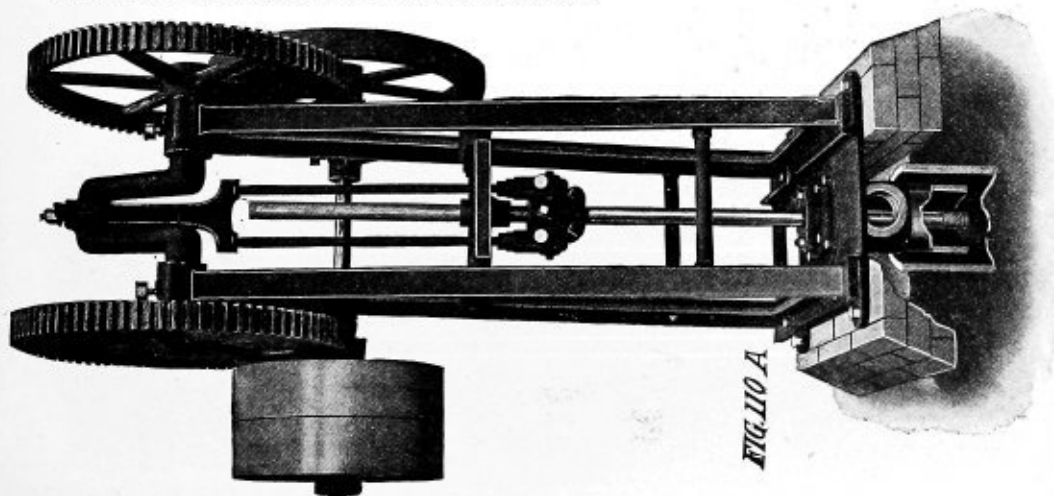
All parts are Machined to Template and Jigs and are interchangeable, making it easy to replace worn or broken parts, which is very essential.

Dimensions Fig. 22* and Fig. 110A Deep Well Power Head

Fig.	No.	PIPE CONNECTIONS OR SMALLER		Stroke	Geared	Floor Space and Height, Inch	PULLEY †		R. P. M.	Total Lifts Varying with Diameter Cylinder, Feet	Provide H. P. Extr. Load	PRICE	
		Suct. Inch	Disc. Inch				Diam. Inch	Face. Inch				Fig. 22	Fig. 110
22	3	6	5	24	6.8 to 1	36x43x91	18	4	25-45	150 to 500	5	\$250.00	.....
110A	11½	6	5	24	6.8 to 1	36x51x91	24	6	25-45	325 to 800	10	.....	\$300.00
110A	21½	10	6	24	8 to 1	46x61x96	28	8	25-45	200 to 600	16	.....	480.00

* Not illustrated—made with single, not double, moulded gears. Will furnish with machine cut gear and pinion instead of moulded for 15 per cent net extra.

† For extreme loads increase pulley diameter 15 per cent at added cost.



"AMERICAN" DOUBLE-ACTING ALL BRASS ARTESIAN WATER CYLINDER

Fig. 379-A illustrates All Brass Flush Cap Type Double-Acting Water Cylinder, in which the inside diameter of cylinder is larger than the inside diameter of column or discharge pipe, therefore, when repairs are necessary you must pull out discharge pipe and cylinder to get at valves, but, with this construction, you can use a larger diameter cylinder. It discharges the full capacity of the cylinder on the down stroke as well as on the up stroke, therefore it is not only *double-acting*, but actually gives Double Quantity. Other so-called double-acting cylinders only give, by actual measurement, the same quantity as a single-acting, but they do deliver a part of this quantity on the down stroke, which would naturally deceive you, unless you measured the quantity.

The Cylinder I and Plunger Rods G and H are of X heavy seamless drawn brass tubing. All other metal parts are of cast brass, including top and bottom couplings into which suction and discharge pipes are screwed. The valves S1 and S2 and D1 are extra heavy and of best quality rubber. The Ball Valve D2 is of brass. The Plunger J is packed with special Flanged Leather as at K and K1; this prevents leakage of water around the rods and is very essential.

When from long service or gritty water, the packing becomes worn and the cylinder does not give its full quantity of water, new leather packing may be put on, making it as good as new. This is not possible where no provision is made for leather packings.

Dimensions and Data Fig. 379-A Double-Acting Brass Cylinder

Inside Diameter Cylinder, Inches	Maximum Stroke, Inches	Capacity when Plunger Travels 100 up feet per Minute.		Top Threaded for Pipe, Inches	Smallest Diam. Cylinder Will Enter, Inches	W't., Lbs.	Price Each
		Gals. per Min.	Gals. per Hour				
3 1/4	24	75	4500	2 1/4	3 1/2	100	\$ 117.00
3 3/4	36	75	4500	3 1/4	4 1/2	120	131.00
4 1/4	24	128	7680	3 1/2	4 3/4	200	140.00
4 3/4	36	128	7680	3 3/4	4 3/4	240	165.00
5 1/4	24	243	14580	4	5 1/4	300	255.00
5 3/4	36	243	14580	4	5 1/4	340	270.00
6 1/4	24	300	18000	5	6 1/4	400	360.00
6 3/4	36	300	18000	5	6 1/4	440	420.00
7 1/4	24	400	24000	5	7 1/4	475	540.00
7 3/4	36	400	24000	5	7 1/4	500	600.00
8 1/4	24	515	30900	6	8 1/4	530	750.00
8 3/4	36	515	30900	6	8 1/4	550	825.00
9 1/4	24	644	38640	7	9 1/4	590	900.00
9 3/4	36	644	38640	7	9 1/4	615	1013.00
11 1/4	24	943	56580	8	12	900	1320.00
11 3/4	36	943	56580	8	12	950	1455.00

On the Up Stroke, Suction Valve S1 opens and space A below the plunger is filled. At the same time, the Discharge Valve D1 opens and water in space E above the plunger is forced up into discharge pipe F.

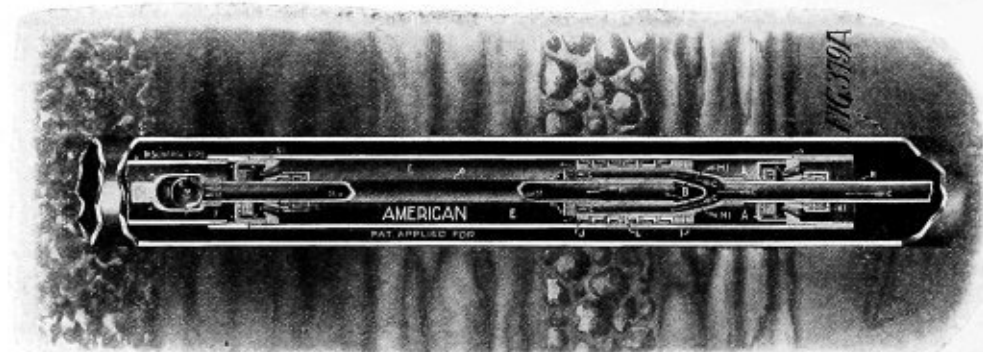
On the Down Stroke, Valves S1 and D1 close and Suction Valve S2 opens and water is drawn through hollow rod H (as indicated by arrow C) and fills space E. At same time the Ball Discharge Valve D2 opens and the water in space A below the plunger is forced up through the hollow rod C (as indicated by arrows M1 and M) into the discharge pipe F.

OPERATION

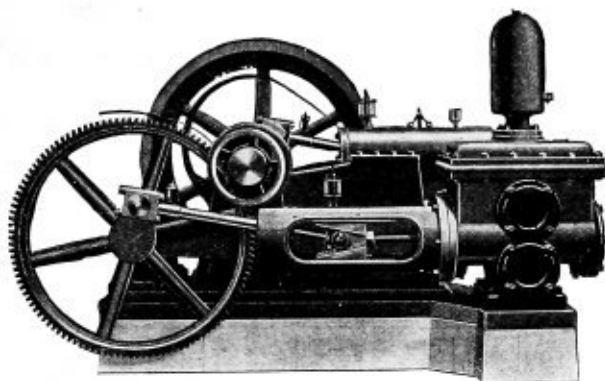
It will give twice as much water as any other water cylinder of same diameter and stroke when run at the same number of strokes per minute.

It may be used with Belt Driven or Steam Pump Heads.

If water obtained in caving materials, have well completed with screen before putting in pump.



GAS OR GASOLINE GEARED PUMPING ENGINE



This machine is entirely self-contained. The engine is mounted on cast-iron sub-base, which also supports the pump. This machine can be placed almost anywhere without special foundation.

The pump used is a standard pattern, the main frame being of the girder pattern, the crosshead guides and main bearings being cast in one piece, insuring perfect alignment.

The crosshead guides are bored and crosshead fitted with adjustable slippers. The gears are of cast iron, accurately cut by machine. The pinion is held in place on crankshaft by friction clutch, which can be thrown in or out while the engine is in motion.

The water end is of the submerged piston type, the cylinder being fitted with removable brass liner; valve seats are of bronze, screwed into decks, valves are of rubber, guards and springs of bronze.

Discharge and suction pipe connections are made with companion flanges. The water end is bolted to crosshead guides and can easily be removed or replaced should extensive repairs be necessary.

All parts of this machine are standard, machined to gauge, and interchangeable. This machine is designed to meet the demand for inexpensive water plants. The first cost is low, and the cost of operation need not exceed the price paid for fuel, as constant attendance is not necessary, as in a steam plant.

Horse Power	Diameter Cylinder	Stroke	Gallons per Stroke	Strokes per Minute	Gallons per Minute	Head in Feet	Suction	Discharge	Floor Space	Shipping Weight
4	5	7	.59	90	53	150	3	3	40 x 89	3500
4	5	8	.68	90	61	125	3	3	40 x 90	3550
4	6	7	.85	90	76	70	4	3	42 x 89	3600
4	6	8	.98	90	88	60	4	3	42 x 90	3700
6	5	7	.59	90	53	250	3	3	41 x 89	4000
6	5	8	.68	90	61	225	3	3	41 x 90	4150
6	6	7	.85	90	76	175	4	3	42 x 89	4200
6	6	8	.98	90	88	160	4	3	42 x 90	4300
8	6	8	.98	80	75	250	4	3	44 x 92	4800
8	7	10	1.66	80	133	135	5	5	45 x 94	4900
8	7	12	1.99	80	160	100	5	5	45 x 96	4950
8	8	12	2.61	80	208	60	6	5	46 x 96	5000
10	7	10	1.66	80	133	175	5	5	45 x 94	5500
10	7	12	1.99	80	160	135	5	5	45 x 96	5700
10	8	12	2.61	80	208	100	6	5	46 x 96	5800
10	10	12	4.08	80	326	60	6	6	47 x 96	5950
15	7	12	1.99	80	160	225	5	5	56 x 98	7500
15	8	12	2.61	80	208	175	6	5	56 x 98	7550
15	10	12	4.08	80	326	100	6	6	56 x 99	7600
15	12	12	5.87	80	469	60	7	7	56 x 99	7700
25	8	12	2.61	80	208	300	6	5	65 x 109	9600
25	10	12	4.08	80	326	200	6	6	65 x 110	9700
25	12	12	5.87	80	469	125	7	7	65 x 110	9800

NOTE—In ordering state capacity, head in feet or pounds pressure and suction lift. Where the pipe line is long give the length with the number of elbows or bends. Details of sizes not listed given on application

ARTESIAN WELL BRASS CYLINDERS OR WORKING BARRELS

Fig. 448—With Bronze Ball Valves

Adapted for deepest open or drilled wells, where the pipe or casing is large enough to take the cylinder attachments. The shell is heavy seamless brass tubing, fitted with hard bronze ball valves and best cupped oak tanned leathers.

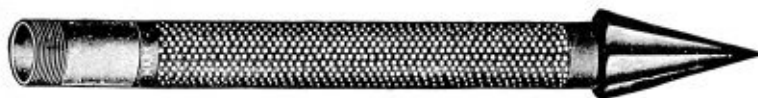
Wood sucker rods with forged couplings are recommended, connecting the plunger and suction rods by means of valve rod. Standard wrought-iron threads used in fittings. For intermediate sizes use next higher list.



No. 448

Inside Diameter, Inches	Length Stroke, Inches	Capacity per Stroke in Gallons	Length Pump Barrel, Inches	Outside Diameter Caps, Inches	Top and Bottom Connecting Pipes, Inches	Size of Pin in Plunger	Octagon Wood Sucker Rod, Inches	Price
1 3/8	16	.10	36	2 3/8	1 1/2	5/8	1 1/8	\$ 15.00
1 3/8	16	.16	33	2 1/8	2	5/8	1 1/8	19.00
1 3/8	24	.25	41	2 1/8	2	5/8	1 1/8	21.00
2 1/4	16	.275	35	3 1/8	2 1/2	7/8	1 3/8	28.00
2 1/4	24	.41	43	3 1/8	2 1/2	7/8	1 3/8	30.00
2 1/4	16	.411	37	3 3/8	3	7/8	1 3/8	36.00
2 1/4	24	.61	45	3 3/8	3	7/8	1 3/8	38.00
2 1/4	30	.77	51	3 3/8	3	7/8	1 3/8	40.00
2 1/4	36	.925	57	3 3/8	3	7/8	1 3/8	42.00
3 1/4	16	.574	41	4 1/8	3 1/2	1	1 3/8	48.00
3 1/4	24	.862	49	4 1/8	3 1/2	1	1 3/8	52.00
3 1/4	30	1.06	55	4 1/8	3 1/2	1	1 3/8	55.00
3 1/4	36	1.292	61	4 1/8	3 1/2	1	1 3/8	58.00
3 3/4	10	.478	37	5 1/8	4	1 3/8	2 1/4	67.50
3 3/4	16	.764	43	5 1/8	4	1 3/8	2 1/4	70.00
3 3/4	20	1.05	47	5 1/8	4	1 3/8	2 1/4	72.50
3 3/4	24	1.147	51	5 1/8	4	1 3/8	2 1/4	75.00
3 3/4	30	1.374	57	5 1/8	4	1 3/8	2 1/4	80.00
3 3/4	36	1.72	63	5 1/8	4	1 3/8	2 1/4	85.00
3 3/4	42	2.00	69	5 1/8	4	1 3/8	2 1/4	90.00
4 1/4	10	.614	39	5 3/4	4 1/2	1 3/8	2 1/4	87.50
4 1/4	16	.982	45	5 3/4	4 1/2	1 3/8	2 1/4	90.00
4 1/4	20	1.23	49	5 3/4	4 1/2	1 3/8	2 1/4	92.50
4 1/4	24	1.473	53	5 3/4	4 1/2	1 3/8	2 1/4	95.00
4 1/4	28	1.72	57	5 3/4	4 1/2	1 3/8	2 1/4	97.50
4 1/4	30	1.842	59	5 3/4	4 1/2	1 3/8	2 1/4	100.00
4 1/4	36	2.21	65	5 3/4	4 1/2	1 3/8	2 1/4	105.00
4 1/4	42	2.60	71	5 3/4	4 1/2	1 3/8	2 1/4	110.00
4 3/4	16	1.227	47	6 1/4	5	1 3/8	2 1/4	127.50
4 3/4	20	1.53	51	6 1/4	5	1 3/8	2 1/4	131.50
4 3/4	24	1.84	55	6 1/4	5	1 3/8	2 1/4	135.00
4 3/4	30	2.30	61	6 1/4	5	1 3/8	2 1/4	142.50
4 3/4	36	2.76	67	6 1/4	5	1 3/8	2 1/4	150.00
4 3/4	42	3.22	73	6 1/4	5	1 3/8	2 1/4	157.50
5 1/4	24	2.696	62	7 1/4	6	1 3/8	2 1/4	195.00
5 1/4	30	3.36	68	7 1/4	6	1 3/8	2 1/4	207.50
5 1/4	36	4.04	74	7 1/4	6	1 3/8	2 1/4	217.50
6 1/4	24	3.716	67	8 3/8	7	1 1/2	3 1/2	300.00
6 1/4	30	4.646	73	8 3/8	7	1 1/2	3 1/2	320.00
6 1/4	36	5.576	79	8 3/8	7	1 1/2	3 1/2	335.00
7 3/4	24	4.9	70	9 1/2	8	1 1/2	3 1/2	450.00
7 3/4	30	6.126	76	9 1/2	8	1 1/2	3 1/2	480.00
7 3/4	36	7.34	82	9 1/2	8	1 1/2	3 1/2	500.00
8 3/4	24	6.247	71	11	9	1 1/2	3 1/2	725.00
8 3/4	30	7.809	77	11	9	1 1/2	3 1/2	775.00
8 3/4	36	9.37	83	11	9	1 1/2	3 1/2	825.00

BRASS JACKET DRIVE WELL POINTS



Trade No.	Inside Diameter, Inches	Length of Point, Inches	Length of Jacket, Inches	Aggregate Number of Square Inches, Openings	No. 60 Gauge, per Dozen	No. 80 Gauge, per Dozen
94	1 1/4	30	24	26 1/2	\$ 46.00	\$ 64.00
98	1 1/4	36	30	33	56.00	76.00
140	1 1/4	30	21	30	60.00	80.00
144	1 1/2	36	30	37 1/2	72.00	95.00
168	2	48	42	43 1/2	105.00	130.00
172	2	48	42	42	135.00	166.00
188	2 1/2	60	54	70	230.00	300.00
208	3	72	60	111 1/2	360.00	470.00
220	4			150	630.00	760.00

FLUSH OR TUBULAR WELL POINTS



Trade No.	Inside Diameter, Inches	Length of Point, Inches	Length of Jacket, Inches	Aggregate Number of Square Inches, Openings	No. 60 Gauge, per Dozen	No. 80 Gauge, per Dozen
117 1/2	1 1/4	30	24	28	\$46.00	\$64.00
118	1 1/4	36	30	28	51.00	68.00
121	1 1/4	36	30	36	56.00	76.00
123	1 1/4	48	30	36	65.00	85.00
127	1 1/4	54	36	39	75.00	97.00

OPEN END OR WELL POINT EXTENSIONS



Trade No.	Inside Diameter, Inches	Length of Point, Inches	Length of Jacket, Inches	Aggregate number of Square Inches, Openings	No. 60 Gauge, per Dozen	No. 80 Gauge, per Dozen
95	1 1/4	30	24	26	\$ 46.00	\$ 64.00
99	1 1/4	36	30	32 1/2	56.00	76.00
141	1 1/4	30	24	30	60.00	80.00
145	1 1/2	36	30	37 1/2	72.00	95.00
169	2	48	42	43 1/2	105.00	130.00
173	2	48	42	61 1/4	135.00	166.00
189	2 1/2	60	54	70	230.00	300.00
209	3	72	60	121 1/2	360.00	470.00
221	4			150	630.00	760.00

WASHER WELL POINTS



Trade No.	Inside Diameter, Inches	Length of Point, Inches	No. of Holes	Aggregate Number of Square Inches, Openings	No. 60 Gauge, per Dozen	No. 80 Gauge, per Dozen
302	1 1/4	30	80	9 1/2	\$ 46.00	\$ 64.00
303	1 1/4	36	100	12	56.00	76.00
321	1 1/4	30	110	13 1/2	60.00	80.00
322	1 1/2	36	130	15 1/2	72.00	95.00
325	2	48	170	20 1/2	105.00	130.00
327	2	48	230	27 1/2	135.00	166.00
333	2 1/2	60	325	39	230.00	300.00
342	3	72	470	56	360.00	470.00
374	4		660	78	630.00	760.00

All the above points are made from best quality wrought iron pipe, galvanized, covered with brass wire cloth and protected by a heavy perforated brass jacket. Any size or number of gauge furnished. Prices on request.



Fig. 400—LARGE SIZE WELL POINTS
FOR WATER WORKS AND RAILROADS

Heavy Pipe—Galvanized

Furnished with Drive Plug or Open End, as Ordered

Fig. 405—IRRIGATION STRAINER

Covered with special woven wire cloth having slotted openings. For efficiency, heavy work and large filtering capacity they have no equal.



Inside Diameter, inches.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Outside Diameter, inches.....	1.435	1.785	2.025	2.495	2.965	3.625	4.125	4.625
No. 60 Gauze, per foot.....	\$0.60	\$0.75	\$0.90	\$1.25	\$2.00	\$2.75	\$3.15	\$3.90
No. 80 Gauze, per foot.....	1.00	1.20	1.45	1.80	3.25	4.00	4.50	5.25

Inside Diameter, inches.....	4 1/2	5	6	7	8	9	10	12
Outside Diameter, inches.....	5.125	5.685	6.745	7.745	8.745	9.805	10.875	12.875
No. 60 Gauze, per foot.....	\$4.50	\$5.25	\$6.00	\$7.50	\$9.00	\$12.00	\$14.00	\$18.00
No. 80 Gauze, per foot.....	6.25	7.50	8.25	9.50	11.50	15.00	18.00	22.50

Furnished with open end unless ordered with drive plug—6 inches of blank on each end.

EUREKA ALL BRASS TUBULAR WELL CYLINDERS

This Cylinder is made of seamless drawn brass tubing, and fitted with poppet plunger and check valves. It is set in place after the well is made, using the setting tool attached to the drill rod to crowd it down to its place. The Dog Spring coupling holds firmly to the walls of the inside of pipe or well casing, while the Cylinder proper is revolved by the setting as it screws down on the coupling, expanding the rubber packing between the Cylinder and coupling and locking it to the pipe. It may be attached to the screen point in the same manner. Printed directions for use sent with each Cylinder.

PRICE LIST OF No. 450

Complete with Valves and Spring Dog Coupling

Size of Well, Inches	Inside Diam., Inches	Stroke, Inches	Price of Cylinder Complete	Size of Well, Inches	Inside Diam., Inches	Stroke, Inches	Price of Cylinder Complete
2	1 1/2	12	\$ 6.40	4 1/2	4	16	\$ 50.00
2 1/2	1 3/4	16	7.60	4 3/4	4	24	58.00
2 3/4	2 1/4	12	11.00	5	4 1/2	24	60.00
3	2 1/2	16	12.50	5 1/2	4 1/2	36	80.00
3 1/2	2 3/4	12	15.00	6	5 1/2	24	112.00
3 3/4	2 3/4	16	17.00	6 1/2	5 1/2	36	136.00
4	3	12	30.00	7	6 1/2	24	180.00
4 1/2	3 1/4	16	33.00	7 1/2	6 1/2	36	220.00
5	3 1/2	12	26.00	8	7 1/4	36	300.00
5 1/2	3 3/4	24	42.00	8 1/2	7 1/4	42	400.00

SEATING TOOL FOR EUREKA BRASS CYLINDERS



Fig. 451

Size of Cylinder.....	2	2 1/2	3	4	5	6	7	8
Price, Each.....	\$0.60	\$0.90	\$1.20	\$2.40	\$6.00	\$8.00	\$10.00	\$12.00



Fig. 450

HEXAGON COUPLINGS FOR IRON RODS



No.	Size Rod, Inches	Threads, per Inch	Malleable, per Lb.	Galvanized, per Lb.	Brass, per Lb.
720	$\frac{3}{8}$	14	\$9.16	\$9.20	\$9.50
724	$\frac{7}{8}$ x $\frac{7}{8}$	12 x 14	16	20	50
726	$\frac{1}{2}$	12	16	20	50
728	$\frac{1}{2}$	12	16	20	50

PIPE AND ROD COUPLINGS



For $\frac{3}{8}$ -inch Pipe and $\frac{5}{8}$ -inch Iron Rod.
No. 429—Pipe or Iron Rod Thread, per Lb. \$0.18
Galvanized, per Lb. .22

REDUCER COUPLINGS

For $\frac{1}{2}$ and $\frac{3}{8}$ -inch Pipe and Steel Pump Rods.



Nos. 438 and 439

Nos. 490 and 491

No.	Size of Rods, Inches	Plain, Price per Lb.	Galvanized, Price per Lb.
438	$\frac{3}{8}$	\$0.25	\$0.30
439	$\frac{1}{2}$	.25	.30
490	$\frac{3}{8}$	.25	.30
491	$\frac{1}{2}$	.25	.30



HEXAGON LOCK NUTS

For Pump Rods.

Galvanized.

No. 492— $\frac{3}{8}$ -inch.....\$0.30
No. 493— $\frac{1}{2}$ -inch......30
No. 494— $\frac{3}{4}$ -inch......50

STEEL SUBSTITUTES

From Wrought Forged Sucker Rod Coupling Thread to Pipe Thread.



No.	Size of Pin, Wrought Forged Coupling	Size of Pipe	Price
825	$\frac{5}{8}$ inches	$\frac{3}{8}$	\$0.50
826	$\frac{7}{8}$ "	$\frac{1}{2}$	.70
827	$\frac{1}{2}$ "	$\frac{1}{2}$	.70
828	$\frac{1}{2}$ "	$\frac{3}{4}$	1.50
829	$\frac{1}{2}$ "	$\frac{1}{2}$	2.25
830	$\frac{1}{2}$ "	$\frac{1}{2}$	2.25
831	$\frac{1}{2}$ "	$\frac{1}{2}$	3.00

CAST STEEL DRIVE SHOES

Turned true both inside and outside.



Size Pipe, Inches	Price Each, Turned	Size Pipe, Inches	Price Each, Turned
2	\$1.00	4 $\frac{1}{2}$	\$6.00
2 $\frac{1}{2}$	1.30	5	7.00
3	2.00	5 $\frac{1}{2}$	9.00
3 $\frac{1}{2}$	3.50	6	9.00
4	4.00	8	12.00

WOOD ROD COUPLINGS

Two, Three and Four Hole



Made with socket for the ends of the rods to prevent them from splitting.

No.	For Rods Size	No. of Holes	Price Plain	Price Galvanized
420	1 and 1 $\frac{1}{2}$	2-hole	\$10.00	\$14.00
425	1 " 1 $\frac{1}{2}$	3 "	16.00	20.00
426	1 $\frac{1}{2}$ " 1 $\frac{1}{2}$	3 "	20.00	24.00
427	1 $\frac{1}{2}$ " 1 $\frac{1}{2}$	4 "	60.00	80.00
428 $\frac{1}{2}$	1 " 1 $\frac{1}{2}$	4 "	20.00	24.00
429 $\frac{1}{2}$	1 $\frac{1}{2}$ " 1 $\frac{1}{2}$	4 "	24.00	28.00

WROUGHT FORGED SUCKER ROD COUPLINGS



These couplings have straight box and pin same size as oil well couplings.

No.	Size Box and Pin	Size of Wood Rod	Adapted for Working Barrels, Diameter, Inches	Plain, per Set	Galvanized, per Set
408	$\frac{5}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ to 2 $\frac{1}{4}$	\$9.60	\$9.85
409	$\frac{7}{8}$	1 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	.75	1.15
410	1	1 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	1.50	1.75
411	1 $\frac{1}{2}$	2 $\frac{1}{4}$	2 " 2 $\frac{1}{4}$	2.00	2.60
412	1 $\frac{1}{2}$	3 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	5.00	6.00

OCTAGON WOOD PUMP RODS



Made of selected Ash and are furnished, unless otherwise specified, in random lengths of about 20 feet.

Size Rod, Inches	Adapted for Working Barrels, Diameter, Inches	Price per Foot, Blank	Price per Foot Fitted with Forged Sucker Rod Couplings	Price per Foot with Galvanized Forged Rod Couplings and Copper Rivets
1 $\frac{1}{2}$	1 $\frac{1}{2}$ to 2 $\frac{1}{4}$	\$0.04	\$0.08	\$0.15
1 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	.05	.11	.20
1 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	.09	.18	.30
2 $\frac{1}{4}$	2 " 2 $\frac{1}{4}$	.14	.25	.40
3 $\frac{1}{2}$	2 " 2 $\frac{1}{4}$	.30	.65	1.10

SUCTION PIPE STRAINER FOR OPEN WELLS AND CISTERNS



With
Set
Screw

Made of Galvanized Malleable Iron covered with a good quality of brass wire cloth, and is non-corrosive.

No.	For Pipe Size	Plain, no Gauge	Galvanized, no Gauge	Galvanized, with Brass Gauge
499	$\frac{3}{4}$	\$0.18	\$0.22	\$0.28
500	1	.18	.22	.28
501	1 $\frac{1}{2}$	.20	.24	.32
502	1 $\frac{1}{2}$	.24	.28	.36
503	2	.35	.40	.50

H.Channon Company.Chicago.

EARTH AUGERS AND SAND PUMPS



Fig. 600



Fig. 603



Fig. 602



Sand Pump—Fig. 629

Size of Hole Augers Will Make, Inches.....	2	2½	3	3½	4	4½	5	6
Fig. 600—Chisel Bit Auger, for Clay and Hard Pan.....	\$6.00	\$6.50	\$7.00	\$8.50	\$10.00	\$15.00	\$20.00	\$25.00
Fig. 602—Ribbon Auger for General Boring.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00
Fig. 603—Twist Auger for General Boring.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00

Sand Pumps—Fig. 629

Size of Well, Inches.....	2	2½	3	4	5	6	7	8
Price, Each.....	\$2.50	\$2.75	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00	\$8.00

Sand Pumps and Drills



Fig. 615

Made
from
Crucible
Steel,
Tempered



Fig. 616

For 2 -in. Well, Fitted for 1-inch Pipe.....	\$2.00
" 2½ " " " " 1-inch Pipe.....	3.00
" 3 " " " " 1-inch Pipe.....	4.00
" 4 " " " " 1-inch Pipe.....	5.00

Expansion Drills

Paddy Closed
Fig. 610Female Paddy Open
Fig. 611

2 -inch Paddy makes 4 -inch Hole.....	\$ 5.00
2½ " " " 4½ " " ".....	6.50
3 " " " 5 " " ".....	8.50
4 " " " 6½ " " ".....	11.00



Steel Drive Heads

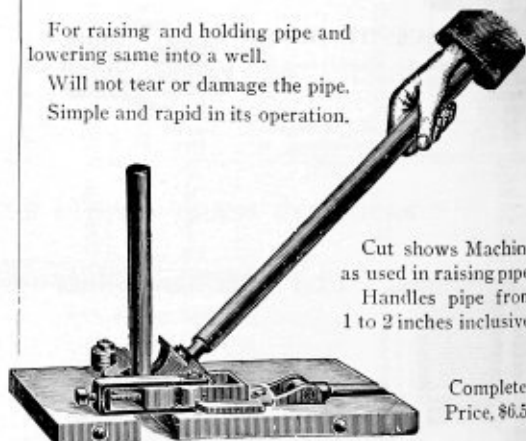
Fig. 619

Size of Pipe, Inches	Price, each
1¼	\$ 1.50
1½	2.00
2	2.50
2½	6.00
3	9.00
4	16.00
5	24.00
6	30.00

Babcock Pipe Lifter and Holder

For raising and holding pipe and lowering same into a well.

Will not tear or damage the pipe.
Simple and rapid in its operation.



Cut shows Machine
as used in raising pipe.
Handles pipe from
1 to 2 inches inclusive.

Complete,
Price, \$6.50

THE "EMERSON" QUICK-CLEANING STRAINER AND FOOT VALVE



Strainer Partially
Raised for
Cleaning

It is never necessary to take up suction pipe to clean strainer. No hinges or springs to get out of order. Applied to suction of any pump. Intake areas largely exceed size of pipe. Cannot cock or clog the valve. Strainer always seats itself properly. Easy to clean and keep clean.

The strainer is made of heavy perforated flange steel, the perforations being 7-16 inches in diameter in all sizes above four inches, and is riveted to a substantial top casting having a collar that fits loosely around the suction pipe, so that it can slide up and down without cramping, and the suction pipe acts as a guide. It is raised and lowered by the ropes, as shown.

The foot valve operates freely in guides cast into the valve body, making it possible to get large and generous openings through the valve with only a low lift of the gate, which prevents hammering and shocks.

Suction Pipe, Inches	Price of Foot Valve and Strainer Complete	Price of Strainer without Foot Valve
2	\$ 11.50	\$ 5.75
2½	12.00	6.00
3	16.25	8.12
3½	18.00	9.00
4	20.00	10.00
5	26.25	13.12
6	33.00	16.50
7	38.50	19.25
8	44.75	22.37
10	82.00	41.00
12	113.00	56.50
14	145.00	72.50
16	190.00	95.00
18	235.00	117.50
20	265.00	132.50
24	400.00	200.00

If Foot valve only is wanted the list price is 75 % of Foot valve and Strainer complete.

STANDARD IRON FOOT VALVES WITH STRAINERS



Size	SCREWED		Flanged Black only, Price each
	Black, Price each	Galvanized, Price each	
2	\$ 2.40	\$ 3.60	\$ 3.50
2½	3.30	5.00	4.50
3	3.90	5.75	5.75
4	7.30	11.00	9.50
5	11.25	16.75	14.00
6	14.25	22.00	17.50
8	41.00	.....	45.00
10	64.00	.....	70.00
12	100.00	.....	112.00
15	.....	.....	150.00
18	.....	.....	235.00
20	.....	.....	265.00

SUCTION HOSE STRAINERS



Size Inches	Solid Brass, Price each	Galvanized Maleable Iron, Price each	Black Maleable Iron, Price each
2	\$ 7.50	.....	.....
2½	8.50	\$1.75	\$1.50
3	10.00	2.00	1.75
4	19.00	3.50	3.00
5	31.00	.....	.....
6	46.00	.....	.....

THE FISHER PUMP GOVERNOR REGULAR STYLE

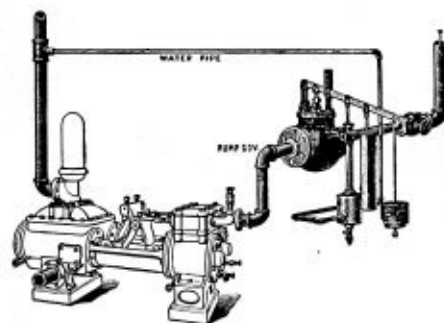
Capacity 10 to 500 pounds, depending on the size of spring used. Thousands of pumps for waterworks, hydraulic elevators, fire, boiler feed, railroad, mine pumps, air compressors and other uses have been equipped with the Fisher. It is simple in construction, easy to operate, automatic, saves the engineer's time, as it will prevent bursting of mains or hose; it saves fuel, as no more steam is used than is necessary to keep the water pressure at the desired point. Phosphor Bronze Valves and Seats on every governor.

ANGLE PATTERN				GLOBE PATTERN			
Screwed		Flanged		Screwed		Flanged	
Size	Price	Size	Price	Size	Price	Size	Price
1/2 in.	\$25.00	1 1/2 in.	\$ 45.00	1/2 in.	\$25.00	1 1/2 in.	\$ 47.50
3/4 in.	27.50	2 in.	50.00	3/4 in.	27.50	2 in.	52.50
1 in.	30.00	2 1/2 in.	60.00	1 in.	30.00	2 1/2 in.	63.00
1 1/4 in.	35.00	3 in.	75.00	1 1/4 in.	35.00	3 in.	78.50
1 1/2 in.	42.50	3 1/2 in.	87.50	1 1/2 in.	42.50	3 1/2 in.	90.00
2 in.	50.00	4 in.	100.00	2 in.	50.00	4 in.	105.00
2 1/2 in.	58.00	5 in.	125.00	2 1/2 in.	58.00	5 in.	130.00
3 in.	70.00	6 in.	150.00	3 in.	70.00	6 in.	160.00
.....	.....	8 in.	225.00	.....	.....	8 in.	235.00

1 and 1 1/4 inch Flanged Governors made to special order at \$5.00 advance over screwed. When ordering, be sure to state maximum and minimum steam and water pressures and whether Screwed or Flanged Style, Angle or Globe Pattern is wanted.



DAVIS PUMP GOVERNOR



Size	Length, Face to Face, Screwed	Length, Face to Face, Flanged	Price, Each
3/4 inches	3 1/4 inches	.....	\$ 25.00
1 "	4 "	.....	30.00
1 1/4 "	4 1/2 "	.....	35.00
1 1/2 "	6 3/4 "	.....	42.00
2 "	7 7/8 "	7 7/8 inches	50.00
2 1/2 "	7 7/8 "	8 7/8 "	60.00
3 "	9 1/4 "	9 1/4 "	75.00
3 1/2 "	10 3/4 "	10 3/4 "	85.00
4 "	12 "	10 3/4 "	100.00
5 "	12 "	12 "	125.00
6 "	.....	13 "	150.00
7 "	.....	14 "	175.00
8 "	.....	16 3/4 "	200.00

3/4 to 1 1/2 Screwed only—2 to 6 Screwed or Flanged—7 inch and over Flanged ends only.

AUTOMATIC PUMP REGULATOR AND CONDENSATION RECEIVER



For controlling the steam pump to return into the boiler the condensation from heating or any other system. It occupies very small space, has large capacity, is simple in construction and operation, acts entirely independent of the pump and can be installed at the most convenient point at different levels and distances from the pump, without impairing its efficiency. The condensation drains into the Receiver through opening near top and raises a copper float attached to a lever, in turn attached to a series of levers, which operate the steam valve. This action opens the steam valve and puts the pump into service emptying the Receiver, and the float, no longer supported by the water, falls, closes the steam valve, and the pump is again out of service. The steam valve is balanced and steam tight.

No.	Inlet and Outlet	Steam Valve	Square Feet of Radiation	Price
0	1 1/2 inch	1/2 inch	5,000	\$ 70.00
1	2 "	3/4 "	10,000	100.00
2	2 1/2 "	1 "	20,000	130.00
3	3 "	1 1/4 "	30,000	150.00
4	4 "	1 1/2 "	40,000	200.00

WORTHINGTON DUPLEX PISTON WATER METERS **FOR GENERAL SERVICE**



This meter is particularly adapted to water-works service. The body, bottom, cap and heads are constructed of the best quality of cast iron. The bearing surfaces of the plungers, plunger rings, slide valves and seats are made of a special brass composition, as are also the lever, spindle, spindle stuffing box and ratchet movement. The counter is designed and constructed with special care, with a view to having it as perfect as possible in all its details. This meter is not affected by the hot water which sometimes backs up in service pipes, a feature appreciated by all meter users. For pressures up to 125 lbs.

Size of Opening In. Pipe	Greatest Proper Quantity Per Minute		Price, Each
	Cubic Ft.	Gals.	
$\frac{5}{8}$	1½ or 11¼		\$ 19.00
$\frac{3}{4}$	3 " 22½		28.00
1	5 " 37½		39.00
1½	6 " 45		45.00
2	8 " 60		55.00
3	23 " 172		130.00
4	60 " 450		375.00
6	120 " 900		900.00

HOT WATER FOR BOILER TESTING



For the continuous measuring of water at temperatures above 120 degrees Fahrenheit, special Hot Water Meters are furnished. These meters differ from the general service meters in that the main cylinders are made of brass, the extra wide linings are of bronze composition, the plungers of hard, close-grained cast iron, making, with the bronze linings, the best bearing surface for this purpose, and special adjustable buffers are placed in the heads, thereby providing means for exact calibration for various services. The meter is of heavier construction throughout, being designed for a working pressure of 200 pounds. When tested and adjusted to meet the conditions under which it will be required to work, this meter will give results of the most satisfactory character.

Size of Opening	Max. H. P. of Boilers	Galv. Iron Case, Brass Lined, Iron Plungers	Galv. Iron Case, Brass Lined, Brass Plungers
$\frac{5}{8}$ in. pipe	60	\$ 42.00	\$ 52.00
$\frac{3}{4}$ " "	120	55.00	65.00
1 " "	175	70.00	85.00
1½ " "	225	85.00	100.00
2 " "	300	105.00	125.00
3 " "	800	185.00	230.00
4 " "	2,500	500.00	650.00
6 " "	5,000	1,275.00	1,650.00

Be sure to state size and kind of boiler and temperature of water.

KEYSTONE WATER METER

Specifications



Size	Price		Greatest proper quantity per min.		Dimensions.			Weight	
	Meter	Con's.	Cu. Ft.	U. S. Gal.	Length, Inches	Width, Inches	Height, Inches	Net, Pounds	Boxed, Pounds
$\frac{5}{8}$ in.	\$ 10.70	\$0.55	2	15	7 3/8	6 3/4	7 3/8	21	18
$\frac{3}{4}$ "	16.00	.80	4	30	9	3	8 3/8	18	25
1	21.35	1.10	8	60	10 7/8	9 3/4	9 3/8	31	35
1¼	33.35	No ch'rg	10	75	11 1/4	11 1/4	11 3/4	45	60
1½	40.00	"	12	90	12 3/8	12 3/4	12 3/8	75	90
2	66.70	"	20	150	14	14 1/4	13 1/4	98	125
3	113.50	"	36	270	24	18 3/4	17 1/4	225	310
4	233.35	"	72	540	30	25 1/4	19 1/2	505	600
6	500.00	"	120	900	36	31 1/4	25	1,000	1,150

Price of $\frac{5}{8}$ -inch meter with connections for $\frac{3}{4}$ -inch standard iron pipe \$10.70; connections \$0.80 per set.



Illustrating the Patented Construction

ROUND TANKS

All sizes listed can be shipped in box car, ready for use.



No.	Diameter, Feet	Height, Feet	Capacity, Barrels	Weight, Lbs.	Price
1	3	2	3 1/2	60	\$ 8.00
2	4	2	6	85	9.50
3	4	2 1/2	7	98	10.75
4	4	3	9	106	12.75
5	4	4	12	155	16.00
6	4	4	14	170	19.00
7	4	4	18	190	23.75
8	4	4	24	225	26.00
9	5	2	9 1/2	115	13.00
10	5	2 1/2	12	140	14.50
11	5	3	14	155	15.50
12	5	4	19	185	21.00
13	5	5	24	215	23.75
14	5	6	28	275	28.00
15	5	8	37 1/2	310	33.00

STEEL TANKS WITH GALVANIZED TRIMMINGS

Any tank on this page will be furnished with all angle, channel and bar irons galvanized at an advance of ten per cent, in list price.

ROUND END TANKS

All sizes listed can be shipped in box car, ready for use.



No.	Width, Feet	Height, Feet	Length, Feet	Capacity, Barrels	Weight, Lbs.	Price
101	2	2	4	3 1/2	62	\$ 7.00
102	2	2	5	4 1/2	78	8.70
103	2	2	6	5 1/2	98	10.25
104	2	2	7	6 1/2	114	11.25
105	2	2	8	7 1/2	131	12.25
106	2	2	10	9 1/2	160	15.00
107	2	2	12	11 1/2	140	14.00
108	2 1/2	2	8	9 1/2	135	13.00
109	2 1/2	2	10	12	175	16.80
110	2 1/2	2	12	14	155	15.00
111	3	2	8	11 1/2	145	14.00
112	3	2	10	14	184	17.50
113	3	2 1/2	8	14	163	16.00
114	3	3	10	18	206	20.00
115	3	3	12	21	227	23.75
116	4	2	8	15	164	18.00
117	4	2	10	19	206	21.50
118	4	2	12	22	242	25.75
119	4	2	14	26	286	29.50
120	4	2	16	30	329	34.00
121	4	2 1/2	8	17	180	20.00
122	4	2 1/2	10	24	232	24.00
123	4	3	16	38	370	38.00
124	4	3	8	23	200	22.00
125	4	3	10	29	255	28.50
126	4	5	10	47	383	41.00
127	5	2	16	38	363	40.00

"AMERICAN" PATENTED GALVANIZED STEEL TANKS

These Tanks are not Carried in Chicago Stock and are Shipped Only from our Factory at Waterloo

SQUARE END TANKS



No.	Width, Feet	Height, Feet	Length, Feet	Capacity, Barrels	Weight, Lbs.	Price
801	2	2	4	3 1/2	90	\$ 8.50
802	2	2	5	4 1/2	105	9.50
803	2	2	6	5 1/2	120	11.00
805	2	2	8	7 1/2	158	16.00
807	2	2	10	9 1/2	175	18.00
808	2	2 1/2	8	9 1/2	175	17.50
810	2	2 1/2	10	12	195	19.50
811	3	2	8	11 1/2	185	18.75
812	3	2	10	14	220	22.00
813	3	2 1/2	8	14	210	20.50
814	3	2 1/2	10	18	240	24.50
815	3	3	10	21	270	26.75
816	4	2	8	15	220	23.00
817	4	2	10	19	265	25.75
821	4	2 1/2	8	17	250	25.00
822	4	2 1/2	10	24	295	28.75
824	4	3	8	23	260	26.40
825	4	3	10	29	325	31.75

STEEL STORAGE TANKS

These are all too large to be shipped set up ready for use, except on a flat car. Unless otherwise specified, they are always shipped K. D.



No.	Diameter, Feet	Height, Feet	Capacity, Barrels	Weight, Lbs.	Price
50	6	6	41	308	\$ 35.00
51	6	8	54	360	43.00
52	8	5	60	426	47.50
53	8	6	72	470	52.50
54	8	8	96	600	65.00
55	8	10	120	736	73.00
56	10	8	150	800	85.00
57	10	10	180	900	95.00
58	12	10	270	1100	128.00

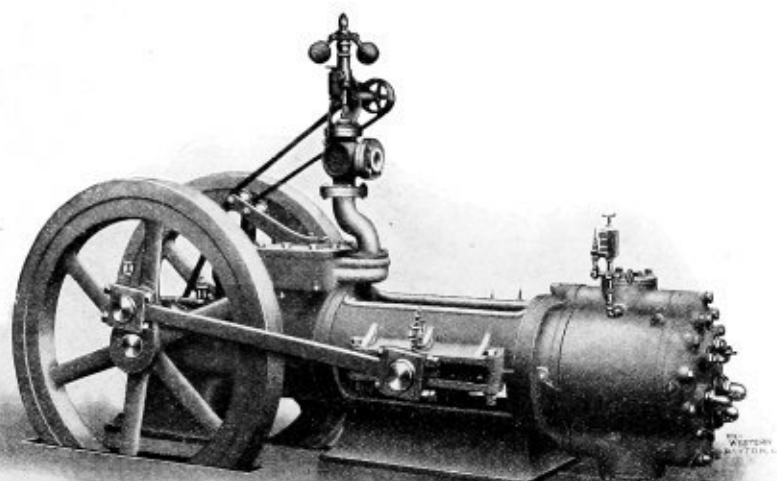
We recommend that Tank No. 50 be built of No. 20 material; Nos. 51, 52, 53 and 54 of No. 18; Nos. 55, 56 and 57 of No. 16; No. 58 of No. 14 material. List prices and weights given above are based on No. 20 metal.

Any American Tank will be built of No. 18 at an advance of 20 per cent.; of No. 16 at an advance of 40 per cent., and of No. 14 metal at an advance of 70 per cent. Prices on tanks made of Nos. 12 and 10 metal will be quoted upon application.

When shipped knocked down they take first class rate of freight. When shipped set up on a flat car they take first class rate of freight with a minimum charge of 5,000 lbs.

Knocked down tanks are shipped with sufficient solder and rivets to complete, and are perfectly fitted at factory to insure their going together properly when they reach destination.

CLASS "A" STRAIGHT LINE, STEAM DRIVEN AIR COMPRESSOR



Cut of 10 x 10 x 10 Machine

Air cylinder is equipped with water jacket. Air valves are of the automatic type and of steel. Inlet valves are located in the upper part of cylinder heads, the discharge valve in the lower half. Crossheads, connecting rods and piston rods are of steel. Connecting rods are equipped with bronze boxes for crosshead and crankpins. The flywheels are of liberal proportions and weight. The lower half of the crosshead guide is adjustable, and crosshead is provided with babbitted buttons. Main shaft bearings are of liberal area and babbitted. The steam valve is of the slide type, with a fixed cutoff, and permitting of use of steam expansively.

SIZE OF CYLINDERS, DIAMETER		Length of Stroke, Inches	Revolutions per Minute	Piston Speed, Feet per Minute	AIR PISTON SWEEP, CUBIC FEET		Air Pressure, Lbs.	Indicated Horse Power	PIPE SIZES				FLOOR SPACE		FLY WHEEL		Diameter of Shaft
Steam	Air				Per Revolution	Per Minute			STEAM		AIR		Length	Width	Diameter	Approximate Weight, Each	
									Steam, Inches	Exhaust, Inches	Inlet, Inches	Outlet, Inches					
6	6	6	100 to 150	100 to 150	19	19 to 28	100	4½ and 5½	1½	1½	2	2	6 ft. x 6 in.	2 ft. x 0 in.	2 ft. x 9½ in.	300	2¼
6	8	6	100 " 150	100 " 150	34	34 " 51	60	5½ " 7½	1½	1½	2	2	" x 6 "	" x 0 "	" x 9½ "	300	2¼
8	8	8	100 " 150	100 " 150	46	46 " 69	100	9 " 13½	1½	1½	2	2	" x 6 "	" x 0 "	" x 11½ "	490	3
8	10	8	100 " 150	100 " 150	72	72 " 108	70	11½ " 16½	1½	1½	2	2	" x 9 "	" x 3 "	" x 11½ "	490	3
10	10	10	100 " 150	100 " 150	90	90 " 134	100	18 " 27	2	2	3	3	" x 6 "	" x 6 "	" x 11½ "	700	3½
10	12	10	100 " 150	100 " 150	125	125 " 190	70	21 " 31	2	2	3	3	" x 9 "	" x 6 "	" x 11½ "	700	3½
12	12	12	100 " 150	100 " 150	160	160 " 235	100	33 " 50	3	3	4	4	" x 7 "	" x 1 "	" x 12½ "	1,060	4½
12	14	12	100 " 150	100 " 150	220	220 " 318	70	40 " 60	3	3	4	4	" x 10 "	" x 1 "	" x 12½ "	1,060	4½
12	16	12	100 " 150	100 " 150	278	278 " 415	50	40 " 60	3	3	4	4	" x 10 "	" x 1 "	" x 12½ "	1,060	4½
12	18	12	100 " 150	100 " 150	350	350 " 525	40	42 " 62	3	3	4	4	" x 8 "	" x 1 "	" x 12½ "	1,060	4½

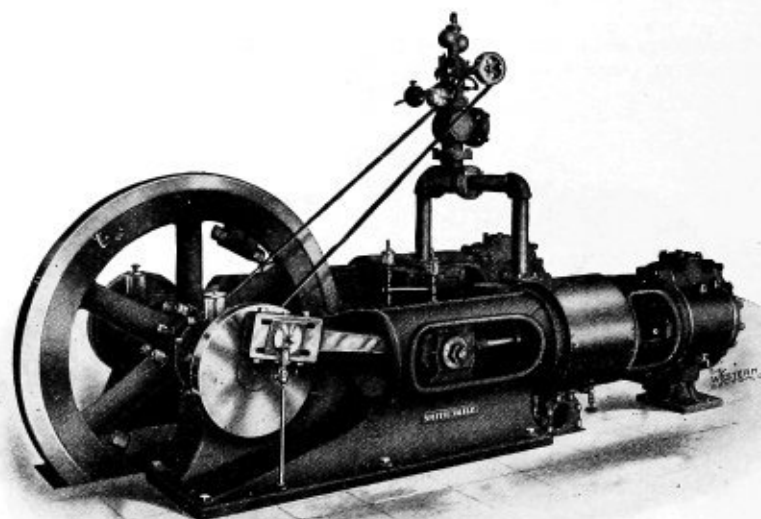
Equipment.

Speed Governor or Combination Speed and Pressure Regulator.
Automatic Air Valves.
Sight-Feed Lubricators for Steam and Air Cylinders.
Special Wrenches Required.

Extras.

Sole Plate.
Lagging for Steam Cylinder.
Unloading Valve.
Throttle Valve.
Foundation Bolts.

CLASS "K," DUPLEX, STEAM ACTUATED AIR COMPRESSORS



Exhibiting Size { 10 x 12 Steam Cylinders.
10 x 12 Air Cylinders.

EQUIPMENT:

Combination Speed and Pressure Regulator.
Automatic Air Valves.
Set Special Wrenches required.
Set Oilers for Bearings.
Sight-Feed Lubricators for Steam and Air Cylinders.
Soleplate for 8-inch Stroke Compressors only.

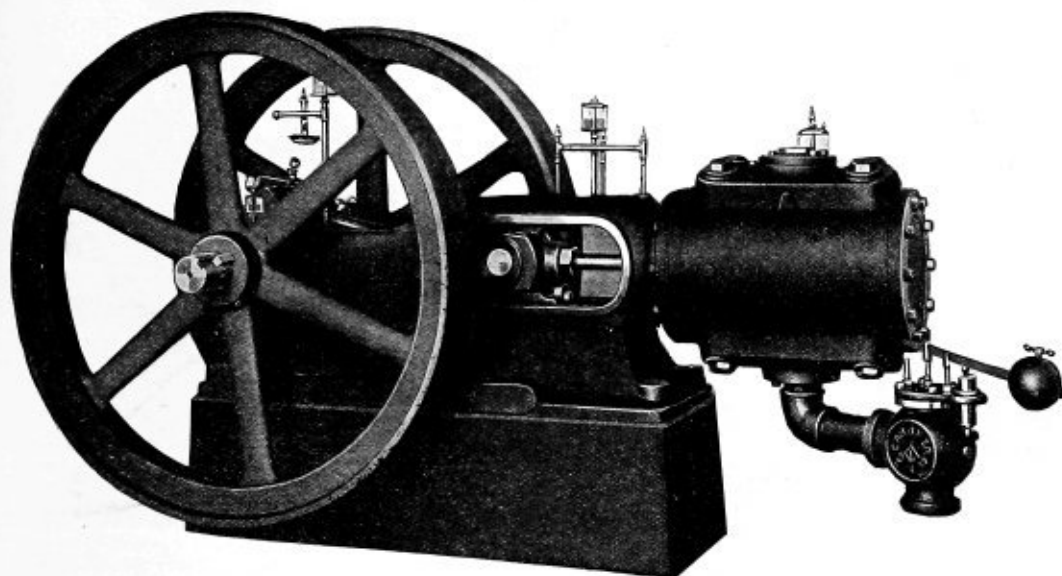
EXTRAS:

Myers' Cut-off Valve for Steam Cylinders.
Mechanically operated Inlet Valves for 10x12-inch Air Cylinders and larger.
Throttle Valve, Foundation Bolts.
Soleplate for larger than size 8x10x8.
Steel Lagging for Steam Cylinders furnished at additional price.

SIZE CYLINDERS			Revolutions per Minute	Piston Speed, Feet per Minute	AIR PISTON SWEEP		Air Pressure, Lbs.	Indicated Horse Power	PIPE SIZES				FLOOR SPACE		FLY-WHEEL		Diameter Shaft
Steam	Air	Length of Stroke			CUBIC FEET				Steam	Exhaust	AIR		Length Ft. In.	Width Ft. In.	Diam. Ft. In.	App. Weight	
					Per Rev.	Per Minute					Inlet	Outlet					
8	8	8	100 to 150	133 to 200	.92	92 to 138	100	20 to 28	2	3	3 1/2	3	9 2	5 0	4 2	1,000	4 1/2
8	10	8	100 " 150	133 " 200	1.4	140 " 210	70	25 " 38	2	3	4	3	9 2	5 0	4 2	1,000	4 1/2
8	12	8	100 " 150	133 " 200	1.9	190 " 285	40	25 " 37	2	3	5	3 1/2	9 3	5 1	4 2	1,000	4 1/2
10	10	12	100 " 150	200 " 300	2.1	210 " 315	100	45 " 65	3	4	4	3	11 3	6 1	4 6	1,400	5 1/2
10	12	12	100 " 150	200 " 300	3.1	310 " 465	70	53 " 80	3	4	5	3 1/2	11 3	6 2	4 6	1,400	5 1/2
10	14	12	100 " 150	200 " 300	4.	400 " 600	50	55 " 82	3	4	5	4	11 5	6 4	4 6	1,400	5 1/2
12	12	12	100 " 150	200 " 300	3.1	310 " 465	100	65 " 95	4	5	5	3 1/2	12 2	7 0	5 0	1,800	6
12	14	12	100 " 150	200 " 300	4.	400 " 600	70	70 " 105	4	5	5	4	12 3	7 2	5 0	1,800	6
12	16	12	100 " 150	200 " 300	5.5	550 " 800	50	75 " 115	4	5	6	5	12 3	6 4	5 0	1,800	6
12	18	12	100 " 150	200 " 300	7.	700 " 1,000	40	85 " 125	4	5	7	5	12 3	6 6	5 0	1,800	6

Duplex machines are also built with simple steam ends, simple air ends, compound steam cylinders and simple air ends; also compound steam and air.

THE GARDNER SINGLE BELT-DRIVEN COMPRESSOR—CLASS A

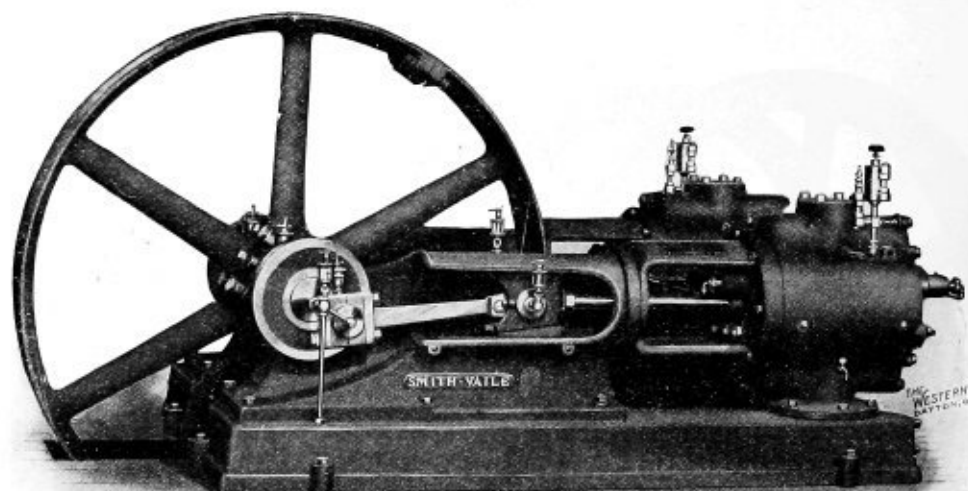


AIR CYLINDER		Revolutions per Minute	Piston Speed per Minute	CAPACITY CUBIC FEET FREE AIR		Air Pressure	Horse-power	PIPE OPENINGS			Diameter of Shaft	TWO WHEELS		FLOOR SPACE			APPROXIMATE WEIGHTS	
Diameter	Stroke			Per Minute	Per Revolution			Suction	Discharge	Jacket		Diameter, Inches	Face, Inches	Length, Inches	Width, Inches	Height Above Foundation, Inches	Two Wheels	Complete Compressor
6	6	150	150	29	.19	100	6	12	12	1 1/2	2 1/4	30	4 1/4	57	22 3/4	31	560	1100
8	8	150	200	67	.45	100	14	2 1/2	2 1/2	1 1/2	2 3/4	41	5 1/2	70 1/2	28	42	970	1900
10	8	150	200	109	.72	50	14	3	3	1 1/2	2 3/4	41	5 1/2	73	28	42	970	2100
10	12	150	300	165	1.09	100	32	3	3	1 1/2	3 1/4	50	6 1/2	96	33	51	1400	3100
12	12	150	300	237	1.57	70	39	3 1/2	3 1/2	1 1/2	3 1/4	50	6 1/2	99	33	51	1400	4000
12	12	150	300	237	1.57	100	49	3 1/2	3 1/2	1 1/2	4	56	7	103	37 1/2	57	2660	5500

Equipment furnished with each machine consists of a full set of foundation bolts, nuts and washers, stationary oiling device with the necessary oilers and wipers, a full set of wrenches and an Unloading Device. This Unloading Device is shown in the cut. It is placed in the inlet pipe and connected with the air receiver. When the predetermined air pressure has been attained, the unloader shuts off the supply, and the compressor runs without load except the power necessary to overcome the friction of the machine. When the receiver pressure falls, the unloader opens, admitting the air, and the compressor resumes its work of compression. The pressure in the receiver is thus kept constant, and there is no waste of power. It is entirely automatic in its action.

For Tables and Useful Information see back part of this book.

CLASS "K-1," DUPLEX BELT-DRIVEN AIR COMPRESSORS



Exhibiting Size 8x8

EQUIPMENT

Soleplate for 8-inch stroke compressors only.
Sight-Feed Lubricators for air cylinders.
Special wrenches required.

SPECIAL

Soleplate for compressors 10-inch stroke and longer.
Unloader valve.
Mechanically operated inlet valves.
Foundation bolts.
Furnished at additional cost.

SIZE OF CYLINDERS		Revolutions per Minute	Piston Displacement, Cubic Feet Per Minute	Air Pressure	Horse Power	AIR PIPE SIZES		FLOOR SPACE		PULLEY	
Diam.	Stroke					Inlet	Outlet	Length	Width	Diam.	Face
8	8	100 to 150	92 to 138	100 lbs.	20 to 28	3½	3	8 ft. 3 in.	4 ft. 10 in.	5 ft. 0 ft.	9½ ft.
10	12	100 " 150	210 " 315	100 "	45 " 65	4	3	11 " 0 "	6 " 1 "	5 " 6 "	18½ "
12	12	100 " 150	310 " 465	100 "	65 " 95	5	3½	11 " 0 "	6 " 3 "	5 " 6 "	18½ "
10	8	100 " 150	140 " 210	70 "	25 " 38	4	3	8 " 3 "	5 " 0 "	5 " 0 "	9½ "
12	12	100 " 150	310 " 465	70 "	53 " 80	5	3½	11 " 0 "	6 " 1 "	5 " 6 "	18½ "
14	12	100 " 150	400 " 600	70 "	70 " 105	5	4	11 " 0 "	6 " 5 "	5 " 6 "	18½ "
16	12	100 " 150	550 " 800	50 "	75 " 115	6	5	11 " 0 "	6 " 7 "	5 " 6 "	18½ "
18	12	100 " 150	700 " 1,000	40 "	85 " 125	7	5	11 " 0 "	6 " 9 "	5 " 6 "	18½ "

Can also furnish Duplex Belt-Driven Machines either with Simple or Compound Air Cylinders.

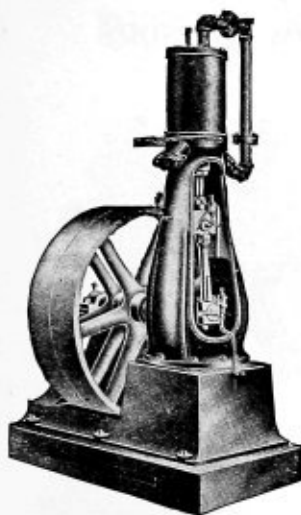
"STAR" VERTICAL AIR COMPRESSORS

A first-class machine at a moderate cost, for air pressures of 50 to 100 pounds. Both heads and cylinders are water jacketed.

The valves and seats are so constructed that they can be removed without interfering with other parts of the machine. The clearance is reduced to a minimum, thus giving the full capacity of the cylinder at every stroke. The best design of metallic packing rings is used, which will admit of the cylinder being lubricated to prevent excessive wear.

These compressors may be used as vacuum pumps, and will give 27 inches of vacuum when thus used. Tight and loose pulleys of ample size and weight are furnished with each belted compressor. These compressors are also coupled direct to steam engine, the engine and compressor crank-pins being set at an angle of 45 degrees with each other on the same shaft.

By this arrangement the engine is developing the most power at the moment the compressor is requiring the most, thus not depending entirely upon the momentum of the flywheel.

**Belted Compressor****BELTED AIR COMPRESSORS**

Diameter of Cylinder, inches.....	4	6	7	8	10
Length of Stroke, inches.....	4	6	7	8	10
Revolutions per minute.....	150	130	130	130	135
Horse Power required for 90 pounds pressure.....	1½	4	7	10	20
Size of Discharge Pipe, inches.....	¾	1¼	1½	2	2½
Size of Water Pipe, inches.....	¾	¾	¾	½	½
Diameter of Tight and Loose Pulleys, inches.....	16	30	38	48	48
Width of Pulley, inches.....	4½	5½	6½	7½	10
Floor space occupied, inches ..	15x28	22x40	25x49	30x57	40x72
Height from floor to top of Compressor.....	3 ft. 8	5 ft. 9	6 ft. 6	7 ft. 10	9 ft. 2
Weight of Compressor, pounds.....	400	1,100	1,700	2,400	4,200
Cubic feet of free air per minute.....	8	25	40	60	120
Price, net.....	\$116.00	\$200.00	\$268.00	\$334.00	\$600.00

AIR COMPRESSOR WITH ENGINE ATTACHED

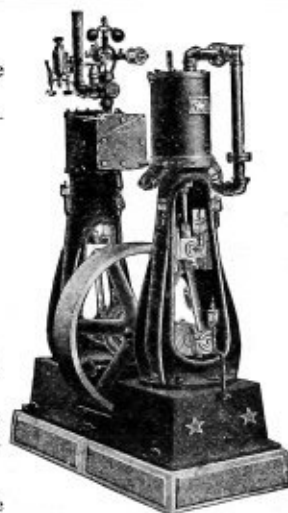
Speed and Pressure Regulating Governors are Furnished with these Compressors

Diameter of Steam Cylinder, inches.....	6	7	8	10
Diameter of Air Cylinder, inches.....	6	7	8	10
Length of Stroke, inches.....	6	7	8	10
Revolutions per minute.....	130	130	130	135
Size of Steam Pipe, inches.....	1	1¼	1½	2½
Size of Exhaust Pipe, inches.....	1¼	1½	2	3
Size of Air Discharge Pipe, inches.....	1¼	1½	2	2½
Size of Water Pipe, inches.....	¾	¾	¾	½
Diameter of Shaft, inches.....	1½	2¼	2½	4½
Diameter of Band Fly-wheel, inches.....	30	38	48	48
Width of Face, inches.....	5½	6½	7½	10
Floor space occupied, inches.....	22x52	26x61	30x69	40x98
Height from floor to top of Compressor.....	5 ft. 9	6 ft. 6	7 ft. 10	9 ft. 2
Weight of Compressor and Engine complete	1,700	2,550	3,575	5,600
Cubic feet of free air per minute.....	25	40	60	120
Price, net.....	\$320.00	\$414.00	\$520.00	\$933.00

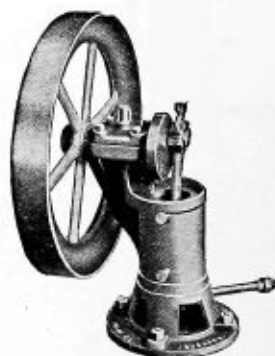
Above prices are for Compressors where from 50 to 100 pounds air pressure is required.

Prices for Compressors where higher or lower pressure is required made on application.

For Tables and Useful Information see back part of this book.

**Steam Driven Compressor**

JACOBSON WATER JACKETED AIR COMPRESSORS



These Compressors are designed and built to meet the requirements of automobile repair shops, pneumatic water supply installations, and are also especially suited for use in connection with pneumatic gas engine starting apparatus. The flywheels are crowned in order that they may be driven by a belt. These wheels are also provided with handle to facilitate operating by hand power. All Double Cylinder machines are tested for a working pressure of 200 pounds per square inch, and are capable of handling their rated capacity in free air at any pressure up to 200 pounds per square inch.

Double Cylinder (For Pressures Up to 200 Lbs.)

Diameter of Cylinders, Inches	Stroke, Inches	Cubic Feet Free Air per Minute	Revolutions per Minute	Air Delivery	Water Pipes, Inches	Floor Space, Inches	Diameter of Pulley, Inches	Weight, Lbs.	Price
3	4	6 1/2	200	1 1/2	1/4	24x31	24x3	340	\$100.00
5	6	27	200	1 1/2	3/8	30x40	30x5 1/2	900	250.00

Single Cylinder (For Pressures Up to 150 Lbs.)

Diameter of Cylinders, Inches	Stroke, Inches	Cubic Feet Free Air per Minute	Revolutions per Minute	Air Delivery	Water Pipes, Inches	Floor Space, Inches	Diameter of Pulley, Inches	Weight, Lbs.	Price
3	4	3 1/2	200	1 1/2	1/4	24x20	24x3	210	65.00

No. 1 AIR PUMP

A Shifter Lever, fulcrumed between the bases of the two cylinders, serves to rapidly start and stop the apparatus.

Upon the finished steel shaft, journaled within adjustable bearings, are mounted the tight and loose pulleys.

The Cranks are secured to the opposite ends of the shaft and placed at an angle of 180 degrees with relation to each other, thus, when being operated, insuring an uninterrupted air supply from the twin cylinder pump.

Connecting Rods are provided at crank pin ends and piston or trunk pin ends, with adjustable bearings.

Valves are furnished with highest grade tool steel balls, hardened and ground, are self-cleaning and not liable to become inefficient through continued and hard usage.

Both Cylinders discharge into one common air chamber located within and forming part of the pump base and provided with an opening for the delivery of the blast.

Adapted for small forges, hardening furnaces, brazers, melting furnaces, soldering plants, etc.

Will run at 300 R. P. M. all day without overheating against pressures up to 10 lbs. or will pump up a large tank to 40 lbs. pressure.

Cylinders are 2 1/2 in. diam. inside, stroke of piston 2 in., tight and loose pulleys 7 3/4 diam. For 1-inch belt, openings 3/4 in. Speed 250 to 300 R. P. M.

Weight 30 lbs. Price.....\$25.00 Floor stand, weight 18 lbs. Price.....\$3.00



WESTINGHOUSE STEAM-DRIVEN LOCOMOTIVE AIR COMPRESSORS

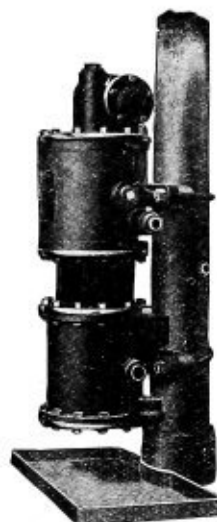
FOR GENERAL INDUSTRIAL PURPOSES



Standard Compressor



Compressor with Stand



Compressor as Attached to Column

The constantly increasing demand for these compressors in all classes of industrial work is, in a large measure, due to their simplicity, neatness and compactness. They are attachable to wall, column, or can be mounted on floor, requiring no foundation. The fact that they are the recognized standard air compressors for railroads is, we believe, a sufficient guarantee of their reliability.

In point of design, it will be readily seen that the compressor is arranged vertically and consists of a steam and air cylinder joined together by a centerpiece. The main steam piston and air piston are both fastened to the same rod and move together as one piece. The supply and exhaust of steam to and from the steam cylinder is controlled by a distribution slide valve in conjunction with a main valve by which it is operated. The movements of the main valve are governed by a reversing valve which is actuated by the main piston. The valve motion is compact, being entirely within the top head, and all its parts are so arranged as to readily permit of their examination or replacement.

Size of Compressor	8 Inch	9½ Inch	11 Inch
Diameter of steam cylinder.....	8 inches	9½ inches	11 inches
" " air cylinder.....	8 "	9½ "	11 "
Stroke.....	10 "	10 "	12 "
Steam admission pipe.....	1 "	1 "	1 "
" exhaust.....	1½ "	1½ "	1½ "
Air admission ".....	1½ "	1½ "	1½ "
" delivery pipe.....	1½ "	1½ "	1½ "
Speed, single stroke per minute.....	120	120	100
Capacity, when operating under conditions of continuous service, at above speed, 90 lbs. pressure..	20 cu. ft.	28 cu. ft.	45 cu. ft.
Over all dimensions.....	43 x 18 x 14 in.	43 x 18 x 14½ in.	51 x 20 x 16 in.
Weight, boxed for shipment.....	560 lbs.	630 lbs.	960 lbs.
Price.....	\$112.50	\$125.00	\$187.50

Also other sizes to meet special conditions of service.

When required for continuous service at pressures exceeding 100 pounds, we can furnish them with special water-jacketed air cylinder at an additional cost.

We can also furnish, if desired, the usual necessary auxiliaries for a compressor plant, such as pump governor, steam valve, reservoirs, air gauges, reducing valves, etc.

SULLIVAN ROCK DRILLS



Mounted on Adjustable Tripod



Drill on Double-Screw Mining Column

PRICES, WEIGHTS AND SPECIFICATIONS OF SULLIVAN ROCK DRILLS (Unmounted)

LETTER INDICATING SIZE	U A	U S	U B	U C	U C2	U D	U E2	U F2	U H	U H2	U K
Diam. of cylinder...in.	2	2½	2½	2½	2½	3	3½	3½	3½	3½	4½
Length of stroke..."	4½	5	5	6½	6	6½	6½	7½	7½	7½	8
Length of feed (depth drilled without changing steel)...in.	12	15	20	24	18	24	24	24	30	24	30
Depth of hole machine will drill easily....ft. from 1 to.....	4	5	6	10	10	12	14	16	20	20	28
Diam. of holes that may be drilled....in.	¾ to 1½	¾ to 2	1 to 2½	1½ to 2½	1½ to 2½	1½ to 3	1½ to 3	1½ to 3	1½ to 4	1½ to 4	2 to 5
Diam. of drill steel, in.	¾ to ¾	¾ to 1	¾ to 1	1 to 1½	1 to 1½	1½ to 1½	1½ to 1½	1½ to 1½	1½ to 1½	1½ to 1½	1½ to 1½
Number of pieces in set of steel to drill holes to depth above stated.....	4	4	4	5	7	6	7	8	8	10	10
Diam. of steam inlet.....in.	¾	¾	¾	1	1	1	1	1	1½	1½	1½
Size of hose to connect to drill.....in.	¾	¾	¾	1	1	1	1	1	1½	1½	1½
Size of steam pipe to carry steam 100 to 200 ft.....in.	¾	1	1	1	1	1½	1½	1½	1½	1½	1½
Size of boiler to supply steam for one drill.....H. P.	5	6	8	8	8	8	10	10	12	12	15
Weight of drill unmounted.....lbs.	110	148	165	233	248	271	268	282	393	347	560
Shipping weight of drill, boxed.....lbs.	141	188	204	279	299	319	315	335	454	401	630
Price of drill unmounted.....	\$200.00	\$220.00	\$240.00	\$265.00	\$265.00	\$300.00	\$330.00	\$350.00	\$430.00	\$430.00	\$465.00
Price of tripod with weights.....	30.00	40.00	50.00	50.00	50.00	55.00	55.00	55.00	60.00	60.00	60.00
Price of single screw mining column.....	37.00	37.00	41.00	41.00	41.00	50.00	50.00	50.00	68.00	68.00	68.00
Price of double screw mining column.....	45.00	45.00	50.00	50.00	50.00	60.00	60.00	60.00	80.00	80.00	80.00
Price 50 ft. steam hose with couplings.....	24.10	24.10	24.10	36.35	36.35	36.35	36.35	36.35	53.35	53.35	53.35

N. B.—In ordering, state whether steam or compressed air is to be used. Drills are always supplied packed for steam, unless otherwise specified.

Prices on quarry bars, drill steels, sand pumps, B. S. tools, etc., quoted upon request.

BADGER ROCK DRILLS

Simple—Has few parts, consequently few repairs—consumes less power.

Complete Outfit

The following list comprises a complete outfit, containing everything necessary for operation except the boiler or air compressor:

1 Rock Drill with throttle valve, oiler and extra set of packing for front head.

1 Adjustable Tripod, with weights.

1 Set of Drill Steels sharpened ready for use.

1 Length of Air or Steam Hose, marline or wire wound with connections.

1 Set of Blacksmith's Tools (5 pieces) for forming and sharpening the drill steel bits.

1 Sand Pump for cleaning out the holes.

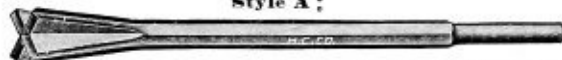
If wanted for quarry work a Quarry Bar may be substituted for the Tripod and for mining or tunneling a Shaft Bar or Column is generally used.



Size (order by this.) Cylinder, inches	2	2 1/8	2 1/2	2 3/4	3	3 1/8	3 1/2	3 3/4
Length of Stroke (Maximum) inches	4 3/4	5 & 6	6	6	6	6 3/4	6 3/4	7 1/4
Length of Feed, inches	1 1/4	20 & 23	26	24 & 3	24 & 31	27 & 31	27 & 31	34
Diameter of Octagonal Steel, inches	3/4 & 7/8	7/8 & 1	7/8 & 1	1 & 1 1/8	1 & 1 1/8	1 1/8 & 1 1/4	1 1/8 & 1 1/4	1 1/4 & 1 1/2
Size of Shank—Diameter and Length, inches	7/8 x 5 1/2	7/8 x 5 1/2	7/8 x 5 1/2	1 x 6 1/2	1 x 6 1/2	1 1/8 x 6 1/2	1 1/8 x 6 1/2	1 1/4 x 6 1/2
Depth of Hole easily drilled, feet	6	8	9	11	12	14	16	20
Diameter of Holes Drilled, inches	1 1/8 to 1 1/2	1 1/4 to 2 1/4	1 1/4 to 2 1/2	1 1/2 to 2 1/2	1 1/2 to 2 1/2	1 1/2 to 3 1/2	1 1/2 to 3 1/2	1 1/2 to 3 1/2
Diameter of Supply Inlet, inches	3/4	3/4	3/4	1	1	1	1	1 1/4
Size of Boiler for ample Steam Supply, horse power	5	6	6	8	8	10	10	12
Diameter of Steam Pipe, for distances up to 150 feet, inches	1	1	1	1	1	1	1	1 1/4
Weight of Drill, unmounted, lbs.	90	150 & 180	168	215 & 250	215 & 250	275 & 278	275 & 278	320
Weight of Adjustable Tripod, lbs.	75	100	145	150	150	189	244	244
Weight of Drill mounted on Tripod, with 3 Weights, lbs.	365	470 & 500	588	641 & 676	641 & 676	791 & 794	816 & 849	930
Price of Drill, complete, unmounted	\$200.00	\$230.00	\$250.00	\$275.00	\$300.00	\$310.00	\$350.00	\$425.00
Price of Adjustable Tripod and Weights, complete	30.00	50.00	50.00	50.00	50.00	55.00	55.00	60.00

Where two weights are given, the lighter weight has shorter feed; if short feed is wanted add the letter "S" to the number, as "2 1/4 S," etc.

Drill steels, columns, B. S. tools, hose and couplings and sand pumps, extra.

DRILL STEELS**Style A:**

Prices below are for Style "A," the standard Bit for hard uniform rock.

Formed and Sharpened Ready for Use.

	For 2 1/2 inch Drill % in x 5 1/2 in. shank—% in. steel					For 2 3/4 inch Drill 1 in x 6 in. shank—1 in. steel				
Size of Bit	2 1/4 ins.	2 ins.	1 3/4 ins.	1 1/2 ins.	1 1/4 ins.	2 3/4 ins.	2 1/2 ins.	2 1/4 ins.	2 ins.	1 3/4 ins.
Length of Steel	18 "	3 ft.	4 ft. 6 in.	6 ft.	7 ft. 6 in.	2 ft.	4 ft. 6 "	7 ft.	9 ft. 6 in.	12 ft.
Price, Each, net	\$1.35	\$1.85	\$2.55	\$3.20	\$3.85	\$1.50	\$2.60	\$3.80	\$4.70	\$5.90

Bits for 3 1/8 in. Badger Rock Drill—1 1/2 in. x 6 in. shank—1 in. steel.

Size of Bit	3 1/8 ins.	3 ins.	2 3/4 ins.	2 1/2 ins.	2 1/4 ins.	2 ins.	1 3/4 ins.	1 1/2 ins.	1 1/4 ins.
Length of Steel	2 ft.	4 ft. 6 in.	7 ft. 4 in.	9 ft. 6 in.	12 ft.	14 ft. 6 in.	17 ft.	19 ft. 6 in.	22 ft.
Price, Each, net	\$1.85	\$3.50	\$5.30	\$6.80	\$8.90	\$10.25	\$11.90	\$13.55	\$15.50

Bits for 3 3/8 in. Badger Rock Drill—1 1/2 in. x 6 in. shank—1 1/4 in. steel.

Size of Bit	3 3/8 ins.	3 1/8 ins.	2 3/4 ins.	2 1/2 ins.	2 1/4 ins.	2 ins.	1 3/4 ins.	1 1/2 ins.	1 1/4 ins.
Length of Steel	2 ft.	4 ft. 8 in.	7 ft. 4 in.	10 ft.	12 ft. 8 "	15 ft. 4 "	18 ft.	20 ft. 8 "	23 ft. 4 in.
Price, Each, net	\$2.15	\$4.25	\$6.50	\$8.75	\$11.00	\$13.00	\$15.50	\$17.30	\$20.00

To secure price on a "set" of bits for a certain depth, commence with the first size and include each following size up to the depth wanted.

For Tables and Useful Information see back part of this book

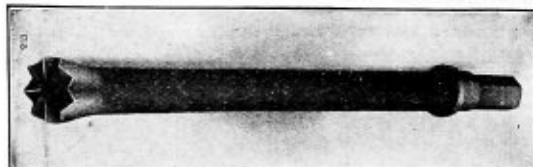
THE "LITTLE JAP" AIR HAMMER ROCK DRILL



Drilling Horizontal Holes with the No. 2
"Little Jap"



No. 2 "Little Jap" Drill



HOLLOW DRILL STEELS

For Use with Nos. 2 and 3 Drills

Size of steel, $\frac{1}{8}$ inch

Length, not including shank, inches	6	12	18	24	30	36	42	48
Diameter of bit, inches	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{8}$
Weight of steels, lbs.	2	3	4	5	6	7	8	9
Price each steel, net	\$1.50	2.25	2.65	3.00	3.40	4.15	4.90	5.65

A complete set of drill steels includes:—4 steels $1\frac{1}{2}$ inches for 6 inch holes, 2— $1\frac{3}{8}$ for 12 inch holes, 1— $1\frac{1}{2}$ inches for 18 inch holes, 1— $1\frac{3}{8}$ for 24 inch holes, 1— $1\frac{1}{2}$ for 30 inch holes and 1— $1\frac{3}{8}$ for 36 inch holes.
Dolly—for sharpening drills, weight 3 lbs. Price..... \$ 5.00
Hose— $\frac{1}{2}$ inch 7 ply anti-peel air hose in 50 ft. sections, with nipples in each end. Price per 50 ft. section..... 15.00

The complete equipment for the Nos. 2 and 3 Drills unless otherwise specified when ordering will be:—1 complete set of steels, 1—25 ft. section of hose and 1—dolly for sharpening.

This portable drill can be handled in any position with equal readiness and is effective in up, down or inclined holes.

It is especially intended for the lighter work in rock excavation such as putting in plug and feather holes, pop holes, anchor holes, stoping, squaring up, cutting hitches, trimming walls, etc.

Adapted for every quality of rock—hard, medium or soft, solid, seamy or broken; the performance depends of course upon the material encountered.

Will drill holes up to a diameter of $1\frac{1}{4}$ inches, down holes to a depth of 18 to 24 inches and on up holes will work to a depth of 48 inches.

In hard granite or quartz a $1\frac{1}{4}$ inch hole can be drilled at the rate of 4 to 5 inches per minute; in sandstone, limestone, 8 to 10 inches. One man can often drill 150 feet of hole per day.

Both drills require 25 to 35 cu. ft. air at 80 to 100 lbs. pressure.

No. 2 DRILL

No. 2 has a hand grip and hand rotation, with a ring port for laying the dust. In operation the handle is grasped with one hand and the rotating lever with the other; the drill is forced forward so that the steel bears against the rock, when the valve is opened by the finger and the hand lever swung back and forth, rotating the entire tool through a portion of a circle and producing a round hole.

No. 2 "Little Jap" Drill, weight, 23 lbs. Price..... \$65.00

No. 3 DRILL

Instead of having the hand grip, the drill is attached to the plunger of an air-feed cylinder fixed on a mounting. Air admitted behind this plunger forces the drill and shell forward against the rock and holds it there as the work progresses, automatically advancing it as the hole deepens. A single hose supplies the Air-Power Feed and the Drill. The maximum travel of the plunger is sixteen inches. This type is supplied with a clamp adapting it for mounting on either a column, bar or tripod.

No. 3 complete with air-power feed, column bar, side arm and clamp, weight 121 lbs. Price..... \$150.00

BOYER PNEUMATIC HAMMERS WITH IMPROVED LOCK



Long Stroke Riveting Hammers
For 100 lbs. Air Pressure



Chipping, Calking and Beading Hammers
For 80 to 100 lbs. Air Pressure



Pistol Grip Stone Hammers
60 to 65 lbs. Air Pressure



Straight Handle Stone Hammers
60 to 65 lbs. Air Pressure

Style	No.	Diam. of Piston	Length of Stroke	Cu. Ft. Free Air per Min.	Work Adapted to	Weight Lbs.	Ap'rox. No. of Blows per Min.	Size Hose Con.	List Price
Long Stroke Riveting Hammers	90	1 1/8	9	25	Driving rivets up to 1 1/4 inch diam.	25	620	3/8	\$100.00
	80	1 1/8	8	25	" " " " 1 1/8 " "	23	700	3/8	100.00
	60	1 1/8	6	25	" " " " 7/8 " "	22	760	3/8	100.00
	00	1 1/8	9	25	" " " " 1 1/8 " "	23	810	3/8	100.00
	5	1 1/8	5	25	" " " " 3/4 " "	20	1,000	3/8	100.00
New Chipping and Calking Hammers	0	1 1/8	5	20	Extra heavy chipping and calking	13 1/2	840	3/8	\$80.00
	1	1 1/8	4	20	Heavy chipping and calking	11 1/2	1,080	3/4	80.00
	2	1 1/8	3	20	Medium " " "	10 1/2	1,500	1/2	80.00
	3	1 1/8	1 1/4	15	Light chipping, calking and flue beading	9 3/4	2,000	1/4	80.00
Pistol Grip Stone Hammers	F	1 1/8	1 1/4	10	Hvy. cutting, roughing, scaling paint and rust	5	2,200	1/4	\$60.00
	O	1 1/8	3/4	7	Light cutting and roughing	3 1/2	3,200	1/4	54.00
	U	1 1/8	1/2	6	Carving and cutting raised letters	3 1/2	3,800	1/4	54.00
	X	1 1/8	1/2	5	Carving, tracing and engraving	3 1/2	3,660	1/4	54.00
Straight Handle Stone Hammers	FF	1 1/8	1 1/4	10	Same as size F	3 1/2	2,200	1/4	\$64.00
	OO	1 1/8	3/4	7	" " " O	2 1/4	2,700	1/4	48.00
	UU	1 1/8	1/2	6	" " " U	2	3,600	1/4	48.00
	XX	1 1/8	1/2	5	" " " X	2	3,500	1/4	48.00

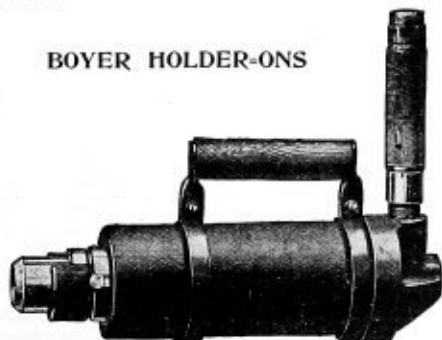
Nos. 90, 80 and 60 hammers furnished, when desired, with automatic safety device, which prevents accidental shooting out of piston or rivet sets. Three rivet sets furnished with each long stroke hammer, either blank or finished. Three hexagon or four round shank tool blanks furnished with each chipping hammer. Five tool blanks with stone hammers.

LONG HOLDER-ON

Diam. of piston..... 3 1/2 in.
Stroke of piston..... 4 "
Shortest length overall, including set.... 15 3/4 "
Hose connection..... 3/8 "
Distance from center of rivet set to side of holder-on..... 1 1/4 "

Price \$35.00

BOYER HOLDER-ONS



Long Holder-on

SHORT HOLDER-ON

Diam. of piston..... 3 1/2 in.
Stroke of piston..... 4 "
Shortest length overall, including set.... 11 1/2 "
Hose connection..... 3/8 "
Distance from center of rivet set to side of holder-on..... 1 "

Price \$33.33

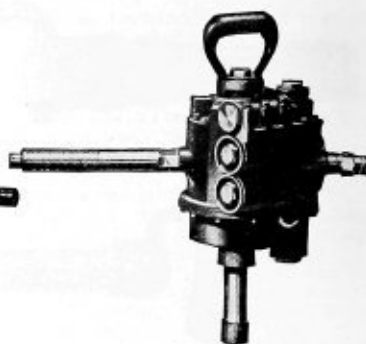
LITTLE GIANT PISTON AIR DRILLS



Style of Nos. 0, 1, 2, 4, 00, 21, 22



No. 3 Machine can also be furnished with Grip Handle and Chuck



Style of Nos. 11, 12, 5, 14



Nos. 2 and 3 Boyer Drills

Phoenix Rotary Drill No. 3

Chicago Breast Drill No. 16

Style	Size No.	Weight, Lbs.	Morse Taper Socket, No.	Square Tap Socket, Inches	Size Drill With Drive, Inches	Reaming, Inches	Stay Bolt Tapping, Inches	Flue Rolling, Inches	Rev. per Min. (Crank-Rev.) 80 lbs. Pressure	Cu. Ft. Free Air Consumed Per Min. at 80 lbs. Pressure	Hose Connections	Price, Each
Little Giant Non-reversible Drills	0	55	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	200	45	1/2	\$146.67
	1	35	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	120	35	3/4	120.00
	2	25	3	3/4	1 1/2	1 1/2	1 1/2	2 1/2	75	25	1	120.00
	4	15	2	3/4	1 1/2	1 1/2	1 1/2	2 1/2	45	15	1 1/4	86.67
Little Giant Reversible Drills	00	60	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	275	45	1/2	150.00
	21	40	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	120	35	3/4	120.00
	22	25	3	3/4	1 1/2	1 1/2	1 1/2	2 1/2	160	25	1	120.00
Rev. Flue Rolling, Reaming and Tapping Machines	11	35	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	200	35	3/4	120.00
	12	25	3	3/4	1 1/2	1 1/2	1 1/2	2 1/2	125	25	1	120.00
Little Giant Wood Boring Machines	3	10	.....	.....	.....	.....	.....	.....	1,200	15	1/4	90.00
	5	14	.....	.....	.....	.....	.....	.....	600	20	3/4	100.00
	14	25	.....	.....	.....	.....	.....	.....	580	25	1 1/4	120.00
Boyer Drills	2	35	4	3/4	1 1/2	1 1/2	1 1/2	2 1/2	160	35	3/4	120.00
	3	25	3	3/4	1 1/2	1 1/2	1 1/2	2 1/2	300	30	3/8	120.00
Chicago Breast Drill	16	10	Chuck	.....	3/8	.....	.....	.....	960	40	3/8	66.67
Phoenix Rotary	3	42	3	3/4	1 1/2	2	2	.....	400	50	1/2	86.67

Little Giant Wood Boring Machines will drive wood bits: No. 3, 1 inch; No. 5, 2 inch; No. 14, up to 4 inch.

THE "INJECTOR" SAND BLAST APPARATUS

For cleaning castings of all kinds, metals for machining, electrotyping, enameling, bronzing and painting; removing scale and paint from all kinds of metal, frosting builders' hardware and gas fixtures, cleaning railroad cars, bridges and steel structures before painting. Cleaning discolorations from wood, stone or brick work. Frosting on glass, and boring holes through glass, etc.



1906 Model

Model	Size, Inches	Capacity Sand, Lbs.	For Nozzles, Inch	Air Conn. Inches	Price
1906	16x30	300	$\frac{1}{4}$ - $\frac{5}{16}$	1	\$250.00
1906	24x24	500	$\frac{1}{4}$ - $\frac{1}{2}$	1	281.25
1906	30x36	1,200	$\frac{1}{4}$ - $\frac{3}{8}$	$1\frac{1}{4}$	375.00
1906	30x48	2,000	$\frac{1}{4}$ - $\frac{5}{8}$	$1\frac{1}{4}$	437.50

With each machine is furnished 12 feet rubber hose, couplings, nozzle holder and 12 steel nozzles.

Air Pressure Required: For light and medium work (stove castings, etc.), 5-10 lbs.; medium and heavy iron castings, 15-20 lbs.; for steel castings, 30 to 75 lbs.; for cleaning buildings and steel structures, 5-30 lbs. (according to height).

THE HELWIG PATENT PNEUMATIC STAYBOLT CLIPPER



Cuts $1\frac{1}{2}$ -inch staybolts and less with ease and great rapidity; leaves the cut square and smooth; has inserted knives, replaced at small cost; cuts at rate of 780 an hour. Weight 170 lbs.; convenient to handle. Price \$350.00.

CHICAGO PNEUMATIC SAND SIFTER
No. 1, FOR FOUNDRIES

Light weight and superior workmanship and construction. Weight 125 lbs. Price, \$75.00.

SAND RAMMERS

The first size is used for bench work; second for general foundry and concrete work; third for general floor work, and the 3x10 "Keller" Rammer for pit and loam work.



Chicago Sand Rammer

"CHICAGO" RAMMERS

Size Inch	Air Used Per Minute	Weight Lbs.	Air Pressure	Blows Per Minute	List Price
$\frac{1}{2}$ x 4	9 cubic feet	7	60 to 80	600 to 800	\$100.00
$1\frac{1}{2}$ x 7	15 "	18	60 " 80	400 " 550	106.67
$1\frac{1}{4}$ x 7	20 "	24	60 " 80	300 " 450	106.67

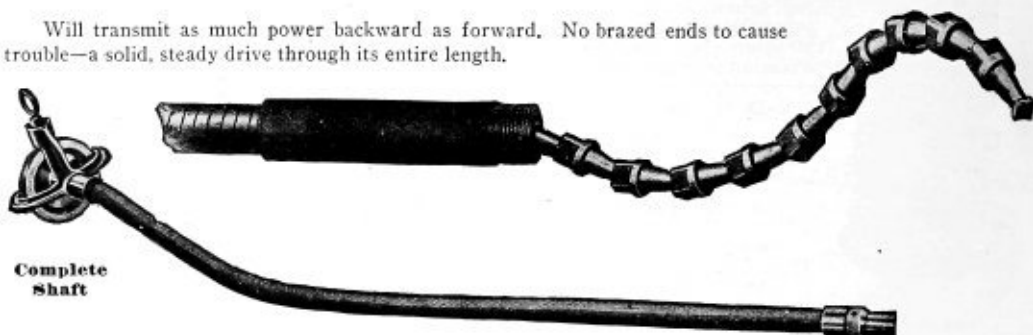
"KELLER" RAMMERS

Size Inch	Air Used Per Minute	Weight Lbs.	Air Pressure	Blows Per Minute	Price
1 x 5	9 cubic feet	7	60 to 80	600 to 800	\$100.00
$1\frac{1}{2}$ x 7	15 "	18	60 " 80	350 " 500	106.67
$1\frac{1}{4}$ x 8	20 "	45	60 " 80	350 " 450	125.00
3 x 10	25 "	280	70 " 90	250 " 300	200.00

"COATES" FLEXIBLE SHAFTS

Hardened Steel, Ball and Socket Joint, Unit Link, Flexible Transmission

Will transmit as much power backward as forward. No brazed ends to cause trouble—a solid, steady drive through its entire length.

**Complete Shaft**

The prices below on flexible shafting include sheave pulley at one end and a sleeve at the other.

Coates Number	Wire Cable Number Corresponding	Standard Length in Feet	Price Complete as per Lower Illustration	Size of Core in inches	WILL DRILL IN STEEL IN INCHES		Price per Foot Extra	Will Transmit H. P. at 1,000 R.P.M.	Counter Shafts, Price
					Breast Drill	With Drill Press			
11	0	3	\$ 16.00	$\frac{3}{16}$	..	.....	\$ 1.80	$\frac{1}{16}$	.....
21	1	5	18.00	$\frac{1}{4}$	..	.....	2.70	$\frac{1}{4}$	\$12.50
31	3	6	30.00	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{8}$	3.75	$\frac{3}{8}$	18.75
44 Special	5	6	50.00	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{7}{8}$	4.50	$1\frac{1}{4}$	23.75
44	6	8	60.00	$\frac{3}{8}$	..	$1\frac{1}{4}$	5.25	2	23.75
55	9	10	100.00	$1\frac{1}{8}$	..	2	12.00	5	23.75
66	11	10	160.00	2	..	3	16.00	10	.....
77	..	10	200.00	$2\frac{1}{2}$	..	$3\frac{1}{2}$	20.00	25	.....

When the term "Flexible Shaft" is used we shall understand that a complete outfit as illustrated above is wanted, unless otherwise specified. For shafts shorter than above deduct $\frac{2}{3}$ the price per foot.

CLUTCH SLEEVE

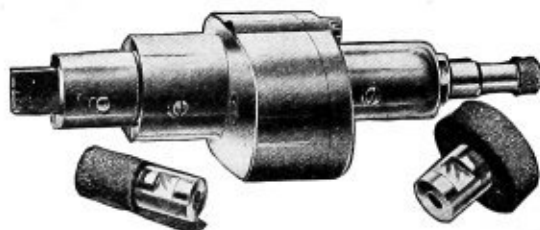
Furnished with shafts No. 33 and larger and included in above prices.

Starts and stops tools with a quarter twist—is interchangeable for using Breast Drills,

Drill Presses, No. 2 Multiplier, Clamp Spindle, D Grinding Head, etc.

CLAMP SPINDLE FOR LARGE WHEELS, SCRATCH BRUSHES, ETC.

The handle is bronzed bushed and the whole equipment is nicely gotten up. Price, \$6.25.

"COATES" PATENT MULTIPLIER**No. 1 Multiplier**

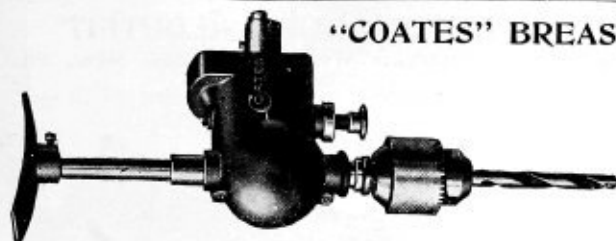
No. 1—Increases speed of Flexible shaft 8 times—No. 2—6 times.

No. 1—Takes $\frac{3}{8}$, $\frac{1}{2}$ and 1 inch Emery wheels—No. 2—takes 2 and 3 inch Emery Wheels.

Price—No. 1—\$25.00

Price—No. 2—25.00

A very useful tool for Drop Forge manufacturers for grinding wrinkles from drawing dies and for internal grinding on irregular blanking dies.

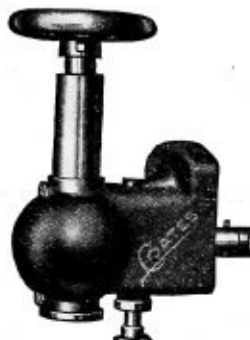
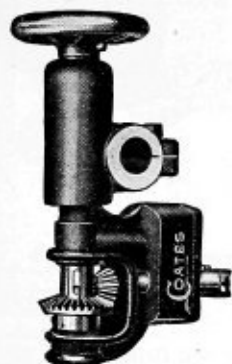
"COATES" BREAST DRILLS

Housed gears, ball bearing thrust.				
Style	A	B	C	D
No. 31	\$19.50	\$25.00	\$30.00	\$45.00
No. 41	25.00	27.00	32.00	47.00

Style A has bevel gears and is for wood or fibre only or for light metal where a high speed is necessary.

Style B is for drilling steel up to $\frac{1}{8}$ inch. Style C is similar to style D but has but one reduction.

Style D is a changeable speed drill. Chuck is strong enough to drill a $\frac{3}{4}$ inch hole.



Designed to be used with Coates Nos. 31 to 44. Flexible shaft and takes No. 3 Morse taper. Capacity up to $1\frac{1}{4}$ inch steel.

Price (with spur top)..... \$35.00
 Price (with press holder) ... 49.00
 Price (with press holder and old man)..... 65.00

3 change speed, 7 to 1, 11 to 1 and 18 to 1.

Coates Variable Speed Drill Press, designed to be used with Coates Nos. 44 and 55 flexible shaft and takes No. 3 Morse taper, taking drills up to $1\frac{1}{4}$ inch but is strong enough for 2 inch steel.

No. 44 (with spur top)..... \$75.00
 No. 55 (with spur top)..... 76.00

For prices with old man and press holder see old man and press holder.

Old man Nos. 31 to 44 (with press holder).....\$30.00

Old man No. 55 (with press holder)..... 32.00

The old man can be attached to any part of a machine, allowing a great latitude of reach. Drills may be held at any angle.

"COATES" PORTABLE ELECTRIC FLEXIBLE SHAFT DRILLING OUTFIT

Can also be used for grinding and buffing

With this outfit, the heavy part (the motor) is placed on the floor out of the way, giving free use of the Breast Drill for the work.

The drill furnished is style B shown above and may be started or stopped instantly by simply giving the clutch sleeve a quarter turn.

By removing the drill, the clamp spindle may be inserted, which takes emery wheels or buffs, making a complete drilling, grinding and buffing outfit in one machine.

Each outfit comprises motor, flexible shaft, breast drill, clamp spindle, buffs, tripoli, wire and plug.



Size	Motor	Drilling capacity, inches	Bufs or Emery wheel	DIRECT CURRENT			Alternating Current, 110 volts
				110 volts	220 volts	500 volts	
A	$\frac{1}{4}$ H. P.	$\frac{3}{16}$	4 inch	\$ 87.50	\$ 90.00	\$ 93.75	\$118.75
B	$\frac{1}{2}$ H. P.	$\frac{1}{2}$	6 inch	114.50	115.75	125.00	156.25

When ordering be sure to state your current and voltage.

"COATES" FLEXIBLE SHAFT ELECTRIC BUFFING OUTFIT

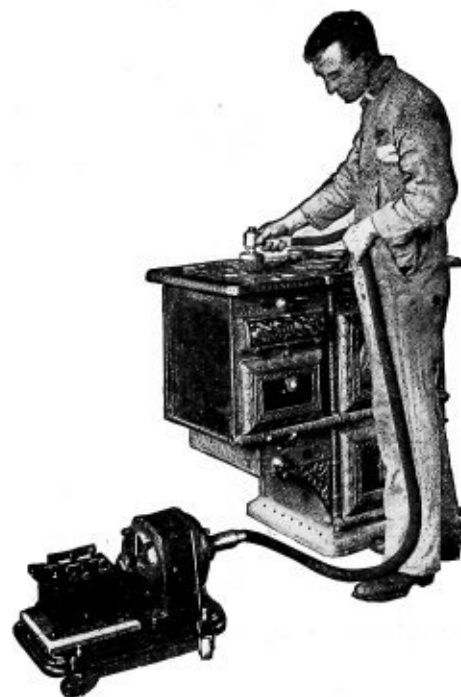
For Burnishing Brass Work on Automobiles, for Chandelier Work, Brass Beds, Signs, Etc.

There is nothing that will do this class of work so well or so quickly as a small buff running at high speed on the end of a flexible shaft.

It Burnishes—Not Scratches

Prices

Including Motor, Flexible Shaft, Buffing Wheels, Tripoli, Wire and attaching plug.
 For Direct Current, 110-220 Volts.....\$59.50
 For Alt. Current, 110 Volts..... 93.75

**COATES STOVE POLISHING OUTFIT**

Electric Motor or Belt Driven

Consisting of 6 feet of flexible shaft in spring casing with cover and taper end sleeve, angle head and brushes.

Electrically Driven

With ½ H. P. motor on truck.

For 110 Volts. Alt. Current.....\$150.00

For 110 or 220 Volts. Direct Current..... 110.00

Belt Driven

Including Countershaft and Sheave Pulley on shaft \$75.00

"COATES" IDEAL FOUNDRY EQUIPMENT

It is impossible to fill up rough castings with paint. Grind them, then paint them, and you will obtain a bicycle finish which in itself makes a big feature to the buyer.

No. 22	Shaft drives 2-in. x ¼-in. emery wheel
" 33	" 4 " x ¾" " "
" 44 Spec."	" 6 " x 1 " " "
" 44	" 9 " x 1 " " "
" 55	" 12 " x 1½" " "

Coates Flexible Shaft Sleeve is made so that one tool may be used after another without any additional expense for special fixtures. Thus a snagging head, surfacing head, scratch brush or drilling equipment may be used at any time. Made electrically driven or belt driven.

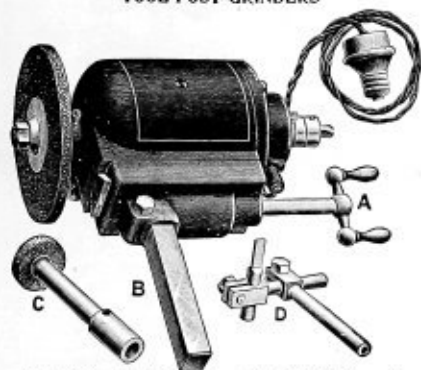


Electrically Driven Foundry Equipment Showing D. Grinding Head in Use

PORTABLE ELECTRIC GRINDERS AND DRILLS

POWER OBTAINED FROM INCANDESCENT LIGHT SOCKET

TOOL POST GRINDERS



Cut of Type "A" Grinder with All Attachments

Type of Grinders	Voltage D. C.	Dimensions, inches	Weight, Lbs.	Horse Power	PRICE	
					D. C.	A. C.
A-110 A-220	110 220	4 3/4 x 7 1/2	16	1/4	\$ 50.00	\$60.00
B-110 B-220	110 220	6 x 10	35	1/2	81.25	97.50
D-110 D-220	110 220	7 x 14	78	1	105.25	142.50

Prices quoted include following attachments:

With Type "A" Grinder

One Emery Wheel, 4 1/2 x 5-16 x 1/2 inches.
One Extension Mandrel, with Wheel 1 1/2 x 3/4 x 3/8 inches.

One Tooth Rest, one Wrench.

With Type "B" Grinder

One Emery Wheel, 8 x 1/2 x 3/4 inches.
One extension Mandrel, with Wheel 2 x 1/2 x 1/2 inches.

With Type "D" Grinder

One Emery Wheel, 8 x 3/4 x 3/4 inches.
Larger or smaller than the above sized wheels can be used.

Care should be taken that the wheel is kept true.

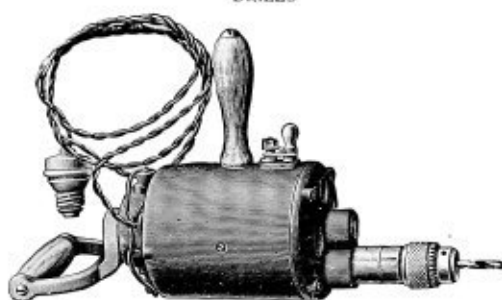
In ordering, always mention type and voltage.

Motor is entirely enclosed in dustproof shell. Spindle carries taper cone bushings, running in 3 and 45 degree bearings. The V-slide has a 3-inch travel by means of a worm through handle (A). Steel shank (B) is fitted to hole in V-cap, held in position by screw, so that different size shanks can be used.

The extension mandrel (C) is used for internal grinding. Tooth rest (D) is a valuable attachment, serving as an index for cutter and reamer grinding.

These grinders have a wide range of work, such as grinding centers, cutters, reamers, dies, rolls, etc.; also surface, parallel and internal grinding jobs of all kinds. The shank of grinder is set in tool post of lathe, planer, shaper and milling machine or clamp in a vise.

DRILLS



Hand or Breast Drill for Drilling Holes in Metal or Wood

No.	Volts	Dimensions Over All, Including Chuck and Handle	Weight Lbs.	Will Hold Drills from	Price with Chuck
G-110 G-220	110 220	4 1/2 x 13 in.	8	0 to 1/4 in.	\$56.25
H-110 H-220	110 220	4 3/4 x 14 in.	10	0 to 3/8 in.	68.75
KS-110 KS-220	110 220	5 1/2 x 16 in.	15	0 to 1/2 in.	81.25

H and K Drills furnished at same price for direct or A.H. current.

Breast attachment, instead of end handle, furnished with any size drill, if desired, same price.

This is, without doubt, one of the handiest little tools on the market. It is designed to take the place of the old style Hand Drill, and is driven at a much higher speed, without exhausting the strength of the operator.

It is under perfect control at all times, as the motor is provided with a switch to start and stop it. It is located near the vertical handle, as shown in illustration, and is easily reached by the index finger.

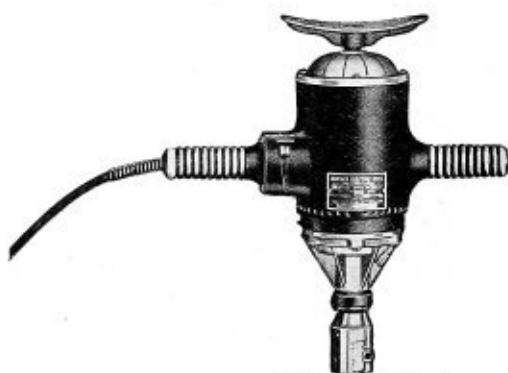
The chuck spindle is so arranged as to allow drilling on a line with the base of the motor, and by this means permitting angle and corner drilling.

The motor is enclosed and suitably geared to develop the necessary power up to the capacity of the drill. Being light in weight, it can be carried anywhere, and the range of operation is not limited, as any length of cord can be used.

Sent out complete, ready for work, with chuck, cord and attachment plug. Any incandescent light socket furnishes the power. Current must be direct.

Simply connect with lamp socket and tool is ready

DUNTLEY PORTABLE AIR-COOLED ELECTRIC DRILLS



Breast Drill

Size No. 2-AM
Two-Motor Type

DIRECT CURRENT DRILLS

Size	Weight, Pounds	Speed, Revolutions per Minute, with Load	Dimensions				Capacity			Power Consumption, With Load		Size of Fuse, Amperes	
			Shortest Length, Top to End of Socket, Inches	Length of Feed, Inches	Distance from Side to Center of Spindle, Inches	Morse Taper Socket, No.	Size of Twist Drill in Iron, Inches	Size of Wood Bit in Oak, Inches	Size of Reamer, Inches	Watts	Horse Power	110 V.	220 V.
Breast Drill	14	600	14	Breast Plate	2 1/8	Chuck	3/8	3/4	....	440	.59	6	3
1-M-1-10	17	400	18	2	3 3/8	Chuck	1/2	1	....	440	.59	6	3
2-Speed Breast D	19	433	14	2	2 3/8	Chuck	3/8-1/2	1	....	440	.59	6	3
1-M-2-12	27	220	17 1/2	3 1/2	4 1/8	2	7/8	1 3/4	....	880	1.18	15	8
1-M-3-19	30	130	18 1/4	3 1/2	4 7/8	3	1 1/4	2 1/2	1 1/8	880	1.18	15	8
2-AM-2-21	30	205	15	4	2 3/4	2	3/8	1 3/4	....	920	1.24	15	8
2-B-M-3-28	40	150	15 1/2	4	3	3	1 1/4	2 1/4	1 1/8	1100	1.48	20	10
2-B-M-4-44	45	100	15 1/2	4	3 3/4	4	2	4	1 3/8	1100	1.48	20	10
2-C-M-4-35	47	125	17 1/2	4 1/2	3 3/4	4	2	4	1 3/8	1500	2.02	20	10
2-DM-4-48	80	90	19 1/2	5 1/2	4 1/4	4	2 1/2	....	1 3/8	2300	3.09	30	15
2-DM-5-105	90	40	21 1/2	5 1/2	4 1/4	5	3	....	1 5/8	2300	3.09	30	15
3-M-4-36	48	110	16 1/8	4 3/4	4 7/8	4	1 3/4	4	1 3/8	1650	2.22	30	15
3-M-4-48	52	85	16 1/8	4 3/4	4 7/8	4	2	....	1 3/8	1650	2.22	30	15

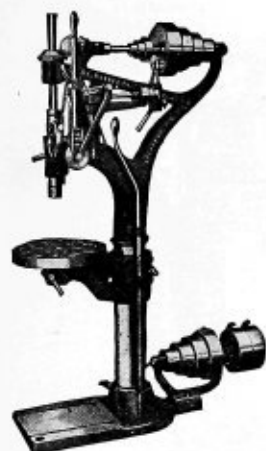
The first five sizes are Single-Motor Type, the last two sizes Three-Motor, balance Two-Motor.

ALTERNATING CURRENT DRILLS

Size	Weight, lbs.	Speed, Revolutions per Minute with Load	Capacity				Chucks and Sockets Furnished	Approximate Power Consumption at Full Load	Built for 110 and 220 Volts, 60 Cycles and Phases Below
			Single Phase		2 or 3 Phase				
			Iron or Steel	Wood	Iron or Steel	Wood			
Breast Drill	14	600	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	No. 0 Drill Chuck	300 Watts	1, 2 and 3 Phase
2 Speed	19	600	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	No. 1 Drill Chuck	350 Watts	1, 2 and 3 Phase
Breast Drill	19	400	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	1	No. 2 M.T. Socket	800 Watts	2 and 3 Phase
2-AC-13	36	250	....	....	$\frac{3}{4}$	$1\frac{1}{2}$	No. 3 M.T. Socket	800 Watts	2 and 3 Phase
2-AC-20	36	165	....	....	1	2	No. 3 M.T. Socket	800 Watts	2 and 3 Phase
3-AC-19	48	170	....	....	$1\frac{1}{4}$	$2\frac{1}{2}$	No. 3 M.T. Socket	1100 Watts	2 and 3 Phase
3-AC-24	48	135	....	....	$1\frac{1}{2}$	3	No. 4 M.T. Socket	1100 Watts	2 and 3 Phase

BARNES' UPRIGHT POWER DRILLS

(All Have Quick Returns)



20-inch Drill with Square Base, Power Feed and Back Geared Complete

Specifications of 20-inch Drills	20-inch Round Base	20-inch Square Base
Height of drill.....	68 inches	68 inches
Column to center of table.....	10 $\frac{1}{8}$ "	10 $\frac{1}{8}$ "
Diameter of column.....	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
" " table.....	16 "	16 "
" " spindle.....	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "
Hole in spindle.....	No. 3 Morse Taper	No. 3 Morse Taper
Vertical travel of table.....	16 inches	16 inches
" " " spindle.....	10 "	10 "
Distance from spindle to base.....	43 "	41 "
Distance from spindle to table.....	26 $\frac{1}{2}$ "	26 $\frac{1}{2}$ "
Diameter large pulley on cone.....	8 $\frac{7}{8}$ "	8 $\frac{7}{8}$ "
" small " " " ".....	4 "	4 "
Net Weight.....	500	550
Price, with plain lever feed.....	\$ 96.00	\$100.00
" wheel and " ".....	100.00	104.00
" power feed and automatic stop.....	120.00	124.00
" back gearing, additional.....	.....	24.00

NOTE—Cone pulleys carry 2 $\frac{1}{2}$ -inch belt. Tight and loose pulleys, 8x2 $\frac{1}{2}$ inches. Speed for ordinary work, 250 revolutions per minute.

LARGER SLIDING HEAD UPRIGHT POWER DRILLS

Specifications of Larger Drills	Size			
	23-inch	26-inch	28-inch	31-inch
Capacity, will drill in steel up to.....	1 $\frac{1}{2}$ in.	1 $\frac{3}{4}$ in.	.....	.....
Height of drill.....	83 "	87 "	94 in.	98 in.
Distance from column to center of table.....	11 $\frac{3}{8}$ "	13 $\frac{1}{8}$ "	14 $\frac{3}{8}$ "	15 $\frac{3}{8}$ "
Diameter of column.....	6 $\frac{1}{2}$ "	7 "	8 "	8 $\frac{1}{2}$ "
" " table.....	19 "	22 $\frac{1}{2}$ "	24 "	26 "
" " spindle.....	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "
Hole in spindle conforms to Morse taper.....	No. 3	No. 4	No. 4	No. 5
Width of column face.....	5 $\frac{1}{2}$ in.	6 in.	7 in.	8 in.
Vertical travel of table.....	18 "	21 $\frac{1}{2}$ "	18 $\frac{1}{2}$ "	17 "
" " " spindle.....	12 "	12 "	15 "	15 "
Travel of sliding head.....	18 "	22 "	23 $\frac{1}{2}$ "	25 $\frac{1}{2}$ "
Greatest distance from spindle to base.....	52 "	54 "	55 $\frac{1}{2}$ "	57 "
" " " table.....	35 $\frac{1}{2}$ "	41 "	41 "	41 "
Diameter of large pulley on cone.....	10 "	10 "	12 $\frac{1}{4}$ "	13 "
" small.....	4 "	4 "	4 $\frac{1}{2}$ "	5 "
Cone pulleys carry, belt.....	2 $\frac{3}{4}$ "	3 "	3 "	3 "
Diameter of crown gear.....	7 $\frac{1}{8}$ "	7 $\frac{7}{8}$ "	8 $\frac{3}{4}$ "	9 $\frac{1}{4}$ "
" " bevel pinion.....	3 $\frac{1}{8}$ "	4 "	4 $\frac{1}{2}$ "	4 $\frac{5}{8}$ "
Ratio of back gearing.....	4 to 1	4 to 1	4 $\frac{1}{2}$ to 1	5 to 1
Size of tight and loose pulleys.....	10 x 3 in.	10 x 3 $\frac{1}{2}$ in.	12 x 4 in.	12 x 4 in.
Speed of tight and loose pulleys, revolutions per minute.....	225	225	200	200
Floor space required.....	18 x 57 in.	21 x 65 in.	24 x 72 in.	26 x 75
Weight, net lbs.....	1,225	1,500	2,130	2,650
Without back gearing, plain lever feed.....	\$200.00	.....	.....	.....
" " " wheel and lever feed.....	210.00	.....	.....	.....
" " " power feed and automatic stop.....	230.00	.....	.....	.....
Add for back gearing.....	30.00	.....	.....	.....
Drills with power feed and automatic stop and back gearing.....	260.00	\$310.00	\$420.00	\$510.00

The 23 and 26-inch drills can also be furnished with stationary head.

Can also furnish these drills in "gangs."

ROBERTSON 21-INCH TILTING TABLE DRILL

The tilting table feature will be greatly appreciated owing to its convenience and great saving effected in drilling, reaming, etc., where holes are at different angles, over the old method of resetting for each operation.

The knee is a heavy casting made in halves, being planed and tongued together. At right angle to the column bore is a large journal, in which fits a swivel stem with worm gear cut and engaging with a worm having a square end stud extending to both sides of the knee for operating from either side. The swivel has a large flanged face graduating from 0 to 90 degrees, and corresponding with the flange in the knee. Lock bolts are also provided for securing it stationary.

These drills are furnished with round or square spindle drive or stationary knee. Our back gear feature is also a very convenient appliance, movement of the lever throws the machine from belt driven to back gear without stopping the machine, or half movement of the lever the machine can be stopped instantly.

SPECIFICATIONS

Column: Diameter, 5½ inches.

Cone Pulley: Largest step, 9 inches. Smallest, 4¼x2½ inches.

Countershaft: Speed, 250 Revolutions. T. and L. Pulley, 8 inches for 2½ Belt.

Dimensions: Height, 70 inches. Floor Space, 42½x15½ inches.

Spindle: Diameter "through" sleeve, 1½ inches. Square Drive, 1½ inches. Sleeve Diameter, 2½ inches. Vertical travel, 9¼ inches. Greatest Distance spindle to base, 38 inches. Hole No. 3 Morse Taper.

Swing: Will drill to center of 21 inches.

Table: Diameter, 15¼ inches.

Full Equipt Weight: Net, 720 lbs; Crated, 800 lbs; Boxed for export, approximately, 850 lbs. Cubic Feet, approximately 20.

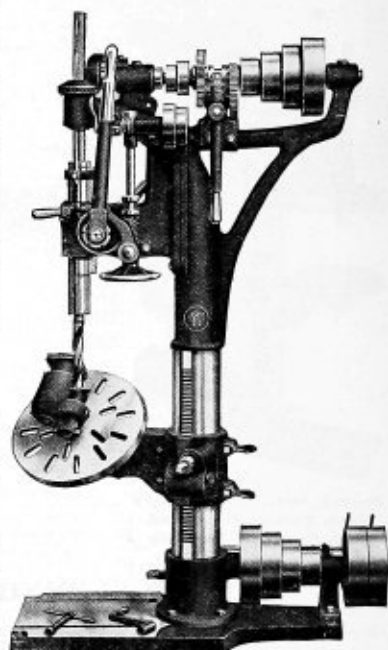
No. 630: Plain Lever Feed. Round Spindle. S. Knee.....\$100.00

No. 631: Wheel and Lever Feed. Round Spindle. S. Knee.....108.00

No. 632: Wheel and Lever and Power Feed. Round Spindle. S. Knee...120.00

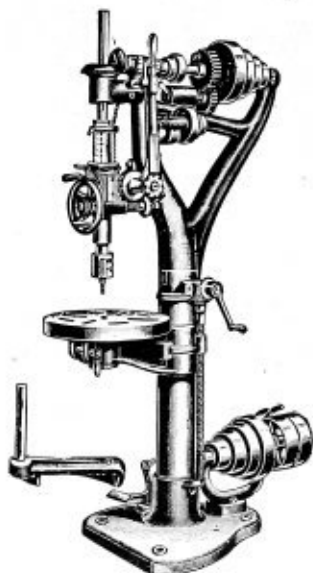
No. 633: Wheel and Lever, Power Feed and Back Gear. Automatic Stop. Round Spindle. S. Knee.....135.00

If tilting table is not wanted deduct \$15.00 from above prices.



THE CHAMPION 20 INCH, BACK-GEARED UPRIGHT POWER DRILL

Capacity 0 to 1 1/2 Inch. Equipped with Three Feeds



Drills to the center of a 20-inch circle, and is built with sliding back gears to meet all kinds of drilling from the smallest to holes up to 1½ inches. It has three distinct and complete feeds:—1st. Self-Feed; 2d. Hand Screw Feed; 3d. Lever Feed.

This drill has been designed for carriage and wagon builders, blacksmiths and for machine shop use. The spindle is counter-balanced by a weight in the hollow column, therefore gives quick return movement to the spindle thus getting the drill bit out of the work instantaneously. The Screw for raising and lowering the table is very convenient, very quick in action and very easy to work. The table always remains where it is stopped. This Drill is supplied with wheel holder for drilling tires. The table arm is also shaped to meet the wants of carriage makers, wagon builders and blacksmiths.

It is a high grade, powerful tool with good workmanship represented in its entire construction. The gears are machine cut and its bearings are large and ground to a working fit.

The dimensions of this drill are as follows: Drills to center of a 20-inch circle. Spindle is 1¼" in diameter and is bored with No. 4 Morse Taper and regularly supplied with the Champion Never-Slip "Patented" Chuck to take in 41/64" straight shank drill bits. If specially ordered Chuck will be furnished to take in ½" straight shank drill bits. Has 4-step cone pulleys carrying a 2 inch belt. The Pulleys for driving the drill are 8x2½". For ordinary drilling the driving pulleys should be run at 300 R. P. M. Drills holes from 0 to 1½ inches. Weight 675 lbs.

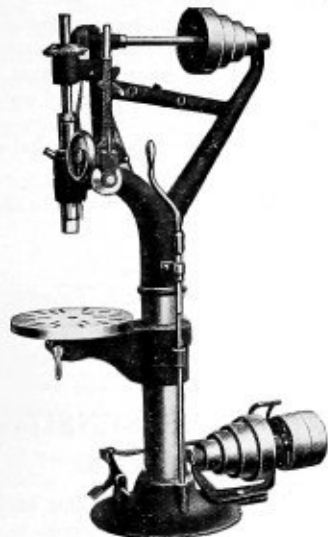
The Champion 20-Inch Back Geared Upright Power Drill Complete (Less Belts).....\$100.00

SILVER'S 20 INCH POWER DRILLS

Dimensions of All Styles Listed

Height	68 1/4 inches
Diameter Column	5 1/2 "
" Table	16 "
" Spindle	1 3/8 "
Vertical Travel of Spindle	10 "
" " Table	16 "
Spindle bored for No. 3 Morse Taper.	
Distance from column to center of table	10 1/4 "
Distance from spindle to base	41 1/4 "

Distance from spindle to table	26 5/8 inches
Diameter of Crown Gear	5 1/8 "
Diameter of Bevel Pinion	3 3/8 "
Diameter Large Pulley on Cone	9 1/4 "
Diameter Small Pulley on Cone	4 "
Cone carries 2 1/2 inch belt.	
Tight and loose pulleys	8"x2 1/4 "
Speed, 200 R. P. M.	
Floor Space—square base	46 x16 "
Floor Space—round base	36 x20 "



Cut shows Round Base Drill No. 857 with Combined Lever and Wheel Feed

ROUND BASE DRILLS

No. 855.—With Lever Feed, w't. 660 lbs..	\$ 85.00
No. 857.—With Combined Lever and Wheel Feed, w't. 660 lbs.....	90.00
No. 859.—With Power Feed and Automatic Stop, w't. 670 lbs.....	110.00
No. 861.—With Back-Gear, Power Feed and Automatic Stop, w't. 710 lbs.	135.00

Extras

Friction countershaft, for tapping, extra.....	\$5.00
V-shaped attachment to fit in supporting arm, for holding wheels to drill the tires..	2.00
Wheel-holding attachment to clamp to column, with spindle to go through wheel..	5.00



Cut Shows Square Base Drill No. 862 with Power Feed, Back-Gear and Auto. Stop

SQUARE BASE DRILLS

No. 856.—With Lever Feed, w't. 700 lbs..	\$ 90.00
No. 858.—With Combined Lever and Wheel Feed, wt. 700 lbs.....	95.00
No. 860.—With Power Feed and Automatic Stop, w't. 710 lbs.....	115.00
No. 862.—With Back-Gear, Power Feed and Automatic Stop, w't. 750 lbs.	140.00

Extras

Friction Countershaft for Tapping.....	\$5.00
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DESCRIPTION OF FEEDS

The Plain Lever Feed is suited for all ordinary work that comes to a Drill of this kind.

The Combined Lever and Wheel Feed permits either the lever or the wheel to be used without affecting the other.

The Power Feed and Automatic Stop requires only to be started and will stop automatically wherever set, at any required depth. This action is entirely independent of the wheel or the lever feed; either of these can be used in addition.

The Power Feed with Back Gearing and Automatic Stop has, in addition to the features of the other Drills, a back-gear friction mechanism. By means of this, four slow speeds are provided for heavier work, making a total of eight different speeds.



THE EXCELSIOR 15 1-2 INCH FRICTION DISC-DRIVEN DRILLING MACHINE

Capacity 0 to 1/2 inch

Features

Has Ball Bearing Hub on Friction Plate.

Driving Wheel—Is built up of Friction paper clamped between two discs. It lasts a long time and is easily replaced.

Speed Variation—Is obtained both on cone pulleys and by shifting driving wheel to and from the center of the friction plate. Change in speed may be quickly made with patented segment clutch without change of belt.

Ball Bearing Thrust Collar—On the spindle and insures smooth running. Column is graduated its full length in a vertical line, making it possible to set center of table in line with spindle at any point of vertical adjustment. Table is counter-balanced by weight in hollow column. It is easily raised and lowered, swung to either side and locked in position by an attached wrench.

Attached Angle Table—Angle iron attachment allows vertical clamping, doing away with separate angle iron.

Countershaft is securely bolted to base.

Has **Bronze Bearings on Shaft.**

Specifications

Base to spindle, inches.....	40 1/2
Table to spindle, inches.....	33 1/2
Diameter column, inches.....	5 1/2
Size table, inches.....	10x10
Column to spindle, inches.....	7 3/4
Drilling circle, inches.....	15 1/2
Dimensions T and L pulleys, inches.....	5x2
Cone pulleys, inches.....	18x8 1/2

Width belts, inches.....	2
Size base square.....	12x20 in. Round 20 in. Diam.
Length belt between cone pulleys.....	9 ft. 9 in.
Speed countershaft.....	350 R. P. M.
Spindle bored for No. 1 Morse Taper.....	
Capacity.....	0 to 1/2 in.
Weight, pounds.....	225
Price—Without chuck.....	\$82.50

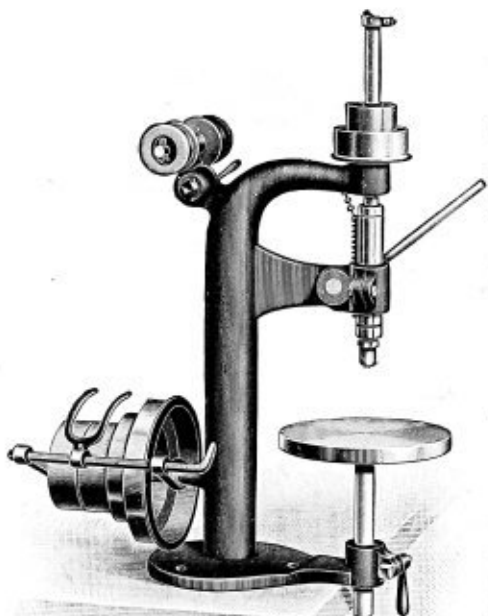
THE ST. LOUIS SENSITIVE BENCH DRILL

This tool is designed for rapid drilling up to 1/4 inch holes in all classes of light material. Spindle is driven by 1 inch flat belt. Has two speeds, cut steel rack and pinion feed, and adjustable stop to gauge depth of holes. It is entirely relieved of belt strain and counter balanced by a weight inside of frame. It is extremely sensitive and uniform to the touch. An arrangement is provided for taking up wear and lost motion. Spindle pulley is so arranged that it will not throw oil. Countershaft is attached to frame and can be placed directly under line shaft, thus obviating the necessity for an independent countershaft. The pulleys are accurately turned inside and out and all rotary parts perfectly balanced. Can be run at a high rate of speed.

Specifications and Price List

Greatest distance from spindle to table.....	8 inches
Vertical movement of spindle.....	2 1/2 inches
Vertical movement of table.....	7 inches
Diameter of table.....	8 inches
Diameter from center of spindle to frame.....	5 1/2 inches
Drill capacity.....	0 to 1/4 inch
Weight without column.....	45 pounds
Weight with column.....	110 pounds
Price of machine without column or chuck.....	\$20.00
Price of column extra.....	6.00
Trump Chuck extra.....	3.20

Unless otherwise ordered Drill will be furnished with Spindle Blank; will be tapered to fit New Model, Almond or Jacobs Chuck without extra cost.



BARNES FOOT POWER SCREW CUTTING LATHES

No. 4½ LATHE

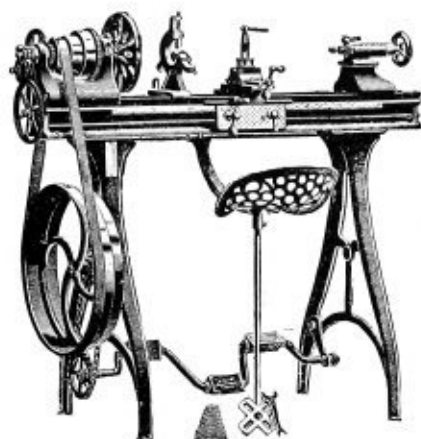
It Swings 9 inches and takes work 25 inches between centers, swinging 4½ inches over tool carriage.

It feeds right or left, and cuts screws right or left without change of gearing. The carriage is thoroughly gibbed for taking up wear.

The tail stock has side movement to adjust centers for turning tapers. The head stock has hollow spindle for rods up to ¾ inch. All the gearing is cut from solid metal.

It is indexed for threads 5 to 40, and the change gears furnished can be combined for many other threads. The small pulley on cone is 2½ inches; the large pulley 4½ inches. Net weight 270 lbs. Boxed ready for shipment, 340 lbs.

Price.....\$65.00
Compound rest, extra..... 8.00
Raising blocks (3 inches), extra..... 10.00



No. 5 LATHE

This lathe is built on the same model as No. 4½ lathe.

It swings 11 inches diameter, and takes work 34 inches long between centers, swinging 6½ inches over the tool carriage.

The head stock has a steel spindle with ⅝-inch hole through its entire length. The tail stock can be readily set at any desired point, or taken altogether from the lathe bed. The tool carriage on our lathe swivels so that the tool can be set to work at any desired angle, and it also adapts the lathe for taper boring. It is indexed for threads 4 to 40, and the change gears furnished can be combined for many other threads.

Net weight 385 lbs. Boxed, ready for shipment, 500 lbs. Price.....\$90.00

HORIZONTAL DRILLING MACHINE

This new machine has been designed particularly for work which, by reason of length, cannot be handled advantageously on either an upright or a radial drill. It is especially adapted for drilling in the ends of long pieces, as, for example, in the end of a column or shaft, and generally for any work within the range of its capacity which cannot be done at all, or with difficulty, on a vertical drilling machine. It is provided with a reversing friction countershaft, adapting the machine for tapping as well as drilling, and is capable of drilling up to one and one-half inches and tapping up to one and one-fourth inches.

Has power feed, hand worm feed, also quick return mechanism.

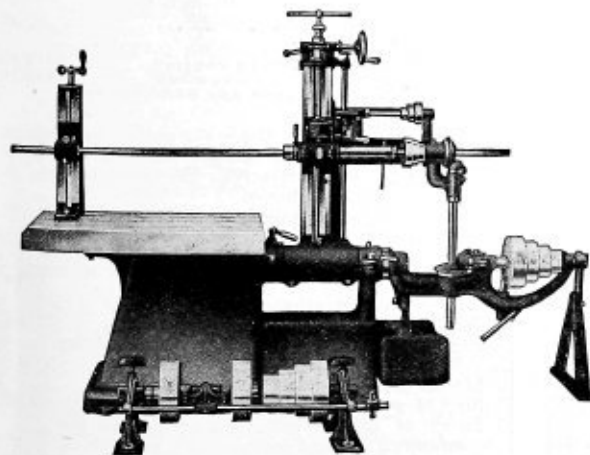
The spindle can be operated at any point through 145 degrees of a circle, having a radius of 24 inches. The table is 20x40 inches and has lateral T slots, so that work can be held either in jigs or bolted to the table. The spindle is 1½ inches in diameter, and is fitted with No. 3 Morse taper, and has travel of 10 inches. Required floor space, 90 x 42 inches.

The tight and loose pulleys on countershaft are 8½ x 2½ inches, and should be speeded 450 revolutions per minute.

Weight 1,800 Lbs.

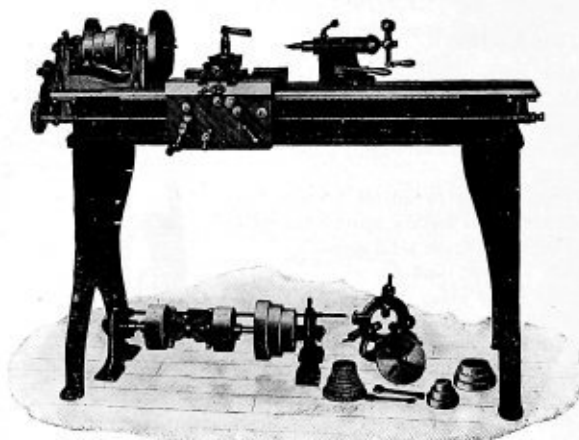
Net without Back Gear and Power

Feed	Price, \$430.00
With Back Gear	" 480.00



BARNES 9-INCH AND 11-INCH SCREW CUTTING LATHE

Furnished Either with Foot Power or Countershaft

Cut of 11-inch Power Lathe
9-INCH

The bed is of ample proportions and is well braced to give strength and rigidity. The head and tail stocks and carriage are fitted to the bed with V in front and with flat bearings in the rear, a construction which insures accuracy and allows great strength to the carriage.

The lathe is indexed for threads from 2 to 48 inclusive.

The equipment includes two face plates, center rest, two centers (hardened and ground), full set of change gears, necessary wrenches—and with the foot power lathe, driving belt.

Furnished with 3 ft. 9-inch bed, taking 24 inches between centers, and with 4 ft. 9-inch bed, taking 36 inches between centers.

Countershaft style can be furnished with SHORT LEGS for BENCH USE.

Specifications

	Inches		Inches
Swing over bed	9 1/4	Cone pulley diameters,	4 1/2, 3 3/4, 2 3/4
Swing over carriage	7	Ratio of back gearing	7 to 1
Front bearing of head stock spindle	1 5/8 x 2 3/4	Width of belt	1 1/4
Back bearing of head stock spindle	1 x 2 3/8	Feed screw, 3/4-inch diameter, 8 thread, Acme	
Hole in spindle	1 1/2	Standard.	
Diameter of tail stock spindle	1 1/4	Slot in tool post takes 5/8 x 1/2-inch tool.	
Diameter of spindle nose, 8 thread	1 1/8	Size of pulleys on countershaft	6 1/2 x 2
Speed of countershaft, 200		revolutions per minute.	
Net Lbs. Crated, Lbs. Boxed, Lbs.		Price, 24 inches between centers	\$115.00
Weight, with foot power	585	Price, 36 inches between centers	\$125.00
Weight, with countershaft	385	For longer beds, add \$6.00 per foot.	

11-INCH

The head stock is very strong and is held by bolts, screwed directly into the bed. The spindle bearings are large; boxes are of phosphor-bronze. The spindles, both for head and tail stocks, are made of high grade steel, and are accurately ground to fit. The carriage, which is fed by a splined screw, has broad bearings on the ways and is thoroughly gibbed. It has compound rest, the base being graduated.

Furnished with 5-ft. bed, taking 36 in. between centers, or with 6-ft. bed, taking 48 in. between centers.

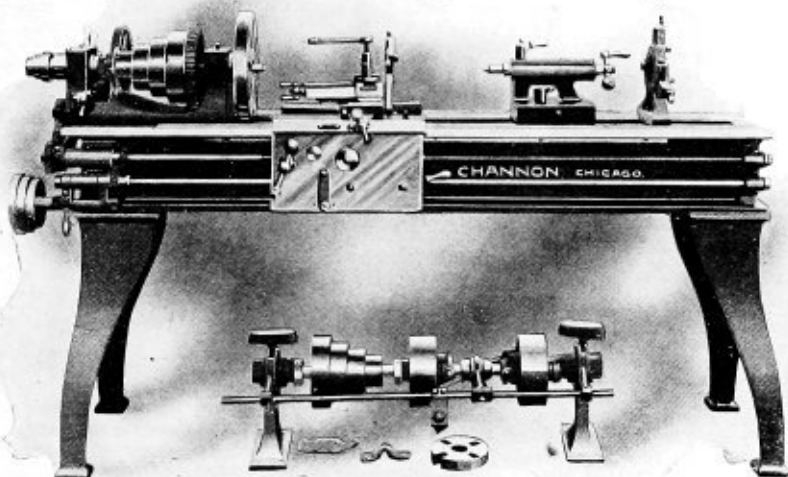
Countershaft style can be furnished with SHORT LEGS for BENCH USE.

Specifications

	Inches		Inches
Swing over bed	11 1/4	Ratio of back gearing, 7 to 1.	
Swing over carriage	7	Width of belt	1 1/4
Front bearing of head stock spindle	1 7/8 x 3	Feed screw, 3/4-inch diameter, 8 thread, Acme	
Back bearing of head stock spindle	1 1/4 x 2 1/2	Standard.	
Hole in spindle	1 1/2	Slot in tool post takes 3/4 x 3/4-inch tool.	
Diameter of tail stock spindle	1 1/4	Size of pulleys on countershaft	6 1/2 x 2
Diameter of spindle nose, 7 thread	1 1/4	Speed of countershaft, 200 revolutions per	
Cone pulley diameters	5 1/2, 4 3/4, 3 3/4	minute.	
Net Lbs. Crated, Lbs. Boxed, Lbs.		Price, 36 in. between centers, 5-foot bed	\$160.00
Weight, with foot power	820	Price, 48 in. between centers, 6-foot bed	\$175.00
Weight, with countershaft	570	For longer beds, add \$5.00 per foot.	

CHANNON'S COMPOUND REST ENGINE LATHE

13½ inch Swing. 6 foot Bed



For accuracy, strength and durability it cannot be excelled. All work is interchangeable; design is strictly modern. We use a 12-inch test bar in the spindle and an indicator, our limit of variation being .001 inch, and closer if so ordered.

THE SPINDLE is a high-grade steel, accurately ground, No. 4 Morse taper, giving large centers, no bushing, but safety plug to protect spindle when center is out.

THE BEARINGS are Phosphor-Bronze.

THE CARRIAGE has a long bearing and is gibbed. It is provided with Lock Screw. Has V-bearing in front and flat bearing in rear, with felt wipers for keeping it clean.

THE POWER CROSS FEED has micrometer adjustment and is thrown in and out by moving a button, shown to left of Cross Feed Handle. A shield to protect screw from chips is furnished.

THE CHASING STOP is always with the Lathe, and not a loose block, which can be mislaid.

THE LEAD SCREW is accurately cut from the best of material. We can cut from 4 to 64 threads, including 11½ to the inch.

It is impossible to throw in Screw and Rod Feed at the same time. We obtain a positive feed by engaging gear on Lead Screw to Feed Rod.

THE FEED CONE is provided with Swinging Belt tightener. Feeds are reversible in head and apron.

THE HEAD AND TAIL STOCKS are fitted to bed with a V at rear and flat bearing in front. This permits our strengthening the cross bridge of carriage. The Tail Stock is provided with set-over.

The front and sides of the apron are polished.

The Nut for Compound Rest Screw is of Phosphor-Bronze, and is on upper side of the Screw, with an accessible and protected oil hole. All oiling arrangements are carefully provided for, including the Compound Rest Swivel.

The Compound Rest is graduated in degrees.

THE DOUBLE FRICTION Countershaft is simple in construction and of an approved design.

EACH LATHE is furnished with Steady and Follow Rests, Large and Small Face Plates, Change Gearing (16 pieces, cut by Brown & Sharpe), Countershaft and Wrench. A Taper Attachment will be furnished when desired; also Draw-in Chucks or Collets for Spindle. This Equipment makes a very desirable Tool-Room Lathe.

PRINCIPAL DIMENSIONS

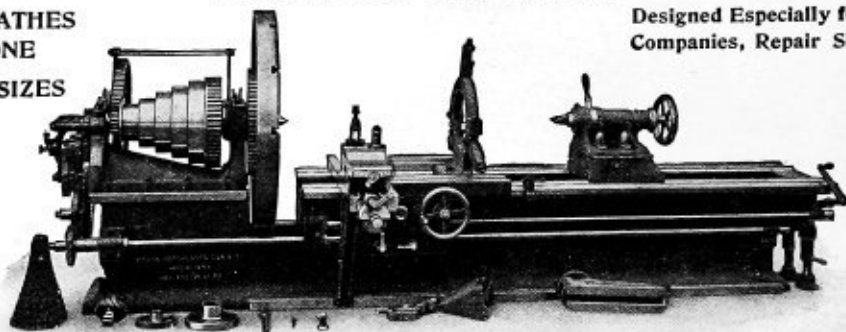
Swing over bed.....	13½ inches	Face of cones.....	1½ inches for 1½-inch belt
Swing over the carriage.....	8½ inches	Speed of countershaft.....	150 revolutions
Length of bed.....	6 feet	Ratio to back gearing.....	9.1 to 1
Distance between centers.....	3 feet 10 inches	Length of tail stock bearing on bed.....	10½ inches
Front bearing of spindle, diameter, 2 inches; length, 3½ inches		Diameter of tail stock spindle.....	1½ inches
Rear bearing of spindle, diameter, 1½ inches; length, 3 inches		Travel of tail stock spindle.....	4½ inches
Morse taper in spindles.....	No. 4	Length of carriage bearing on bed.....	16 inches
Diameter of head cone pulley.....	3½, 5, 6½ and 8 inches	Travel of compound rest.....	3 inches
Size of lathe tool.....	¼x1 inch	Pitch of lead screw.....	8
Size of Countershaft pulleys.....	9 inches; face, 3 inches; for 2½-inch belt	Lathe cuts threads.....	4 to 64, including 11½
		Weight of lathe.....	1,300 lbs. net
Price.....			\$300.00
Price, Taper Attachment, extra.....			50.00
Price, Draw-in Chuck and one Collet, extra.....			40.00

We can furnish this Lathe also with 5 or 8 foot Bed.

EXTENSION GAP LATHES

TWO LATHES
IN ONE
FOUR SIZES

Designed Especially for Mining
Companies, Repair Shops, Etc.



As an improvement on gap lathes, the extension feature permits making the gap wide or narrow to suit the work, also allows turning a much longer shaft, as the distance between centers may be doubled by extension of top portion of bed. Ample power to turn full diameter of swing over lower bed, has capacity for a wide range of work, is handy, and not awkward to operate.

BED is made extra deep, webbed its entire length; top bed has crossties at frequent intervals, carefully fitted to lower guides drawn back by means of handwheel and screw at rear end.

CONE has five sections, back geared and geared face plate, forged crucible steel spindles, phosphor-bronze boxes. Cone feed gears on end of head have a sliding clutch pin, which provides three variations of feed without changing gears.

TAIL STOCK has setover for taper work, dead spindle clamped by adjustable conical binder.

CARRIAGE has long bearings, which are self-oiling, decreasing the liability to cut the guides when used on short work, is well gibbed back and front; hand movement by means of handwheel and steel pinion engaging in rack on bed. Cut steel rack is put on in sections, enabling repair by supplying a new section. Carriage will traverse full length of top slide when drawn back, extended portion of carriage for turning full swing of lathe, is rigidly supported by an angle or bracket, having an adjustable shoe or guide on bottom of bed. This insures a firm support for the turning tool, so that a heavy cut may be taken when turning full diameter. On 25 and also 28 inch sizes, a side block is furnished for turning wide faces over gap.

COMPOUND REST has long bearings on cross slide and is fitted with taper gib for taking up wear.

FEED APRON attached to carriage, has independent geared friction feed, reverse feed and power cross feed, and so arranged that turning and screw cutting feeds cannot become engaged at the same time. All feeds are reversed at apron.

THE LEAD SCREW on front of lathe is clamped by open and shut nut, the screw threads being used only when cutting screws. Screw gearing, steady and following rests, large and small face plates, steel wrenches, handles and cross feed stops. (The following rest and small face plate are not furnished with the 36-inch and 48-inch lathes, the large face plate being keyed to spindle on these sizes.)

	25 and 39 in.	28 and 48 in.	36 and 60 in.	48 and 72 in.
Swing over top shears.....	25 in.	28 in.	36 in.	48 in.
Swing over lower guides.....	39 " "	48 " "	60 " "	72 " "
Swing over carriage.....	19 " "	21 " "	25 1/2 " "	29 " "
Ratio of back gearing.....	25 1/2	28	35 1/2	53 1/2
Leverage of cone and gearing.....	100 1/2	112	156	221
Cuts all regular threads (including 1 1/4 in. pipe thread)	1 to 22	1/2 to 16	1/4 to 14	1/4 to 16
Feeds per inch.....	3.5 to 77	2.3 to 74.6	1.7 to 52	1.9 to 54.6
Cone diameters.....	16 in., 13 1/2 in., 11 1/2 " 9 1/4 "	18 in., 15 1/2 in., 13 1/2 " 10 1/2 "	23 in., 19 1/2 in., 16 1/2 " 13 1/4 "	28 in., 24 1/2 in., 21 " 17 1/2 "
Face of cone steps.....	3 1/2 "	3 1/2 "	4 1/2 "	4 1/2 "
Front bearing of spindle.....	3 1/2 in. diam. 5 1/2 " long	4 1/2 in. diam. 6 1/2 " long	5 in. diam. 7 1/2 " long	6 in. diam. 9 " long
Back bearing of spindle.....	2 1/2 " diam. 3 " long	2 1/2 " diam. 3 1/2 " long	2 1/2 " diam. 3 " long	3 1/2 " diam. 4 1/2 " long
Tail spindle.....	2 1/2 " diam. 15 1/2 " long	3 " diam. 19 " long	3 1/2 " diam. 22 " long	4 " diam. 24 " long
Length of bed.....	12 1/2 ft. 8 " "	13 1/2 ft. 8 " "	14 1/2 ft. 8 " "	15 1/2 ft. 8 " "
Distance between centers } Closed.....	15 "	15 "	15 "	15 "
Countershaft, three pulleys.....	16 x 7 in. 22 x 4 "	22 x 8 in.	24 x 8 in.	24 x 8 in.
Speed of countershaft, three pulleys.....	85	80	80	110
Weight.....	54 6,500 lbs.	80 9,700 lbs.	80 15,000 lbs.	110 19,000 lbs.

BURR PORTABLE SHAFT KEYSEATERS HAND POWER

No. 1 MACHINE

Mills keyseats in shafting in position up to 5-inch diameter.
Mills keyseats up to $1\frac{1}{4} \times \frac{5}{8}$ inches full width at one cut.
Support directly under cutter at all times.
Mills keyseats without chatters.
Mills keyseats with true sides and smooth bottoms.
Self-centering and automatic feed.
Machine has five cutters, by which keyseats from $\frac{1}{4}$ inch to $1\frac{1}{4}$ inch wide, varying $\frac{1}{8}$ inch, may be cut full width at one operation.

Weight, boxed, lbs. 100
Price complete with cutters.....net, \$55.00

No. 2 MACHINE

Will mill keyseats on the end or in the middle of shafts up to 8 inches diameter and will cut 12 inches without resetting. By sliding the machine along after each 12 inches is milled, keyseats of any length may be cut.

Keyseats as large as 2 inches wide by 1 inch deep may be cut accurately and efficiently on this machine, the sliding support under the cutters at all times eliminating chatter or jar and making keyseats with straight sides and smooth bottoms.

Weight, boxed, lbs. 250 Price.....net, \$90.00
Further particulars upon request.

"GIANT" POWER KEYSEATERS FOR HUBS OF PULLEYS, WHEELS, ETC.

No.	Adj. Stroke, Inches	Capacity Width of Keyseat, Inches	Will Take Posts	T. and L. Pulleys	Gross Weight, Pounds	Price
0	0 to 7	$\frac{3}{4}$	$\frac{1}{2}$ to $1\frac{1}{2}$	18 x 3	650	\$150.00
2	13	$1\frac{1}{4}$	$\frac{1}{2}$ " $2\frac{3}{8}$	10 x 3	1,500	250.00
3	16	2	$\frac{1}{2}$ " $3\frac{3}{8}$	10 x 3	1,900	315.00
3A	25	2	$\frac{1}{2}$ " $3\frac{3}{4}$	10 x 3	2,000	450.00
4	19	$2\frac{1}{2}$	$\frac{1}{2}$ " $3\frac{1}{2}$	10 x 3	2,100	375.00
5	25	$3\frac{1}{2}$	Up " $4\frac{7}{8}$	14 x 5	4,300	575.00
6	31	4	" " $5\frac{5}{8}$	14 x 5	4,800	700.00

Prices do not include tool posts, cutters, countershaft, key-rise or power feed, as they generally vary with each outfit.

Countershaft for Nos. 2, 3, 3A and 4.....	\$18.75
" " " 5 and 6	31.25
Key-rise 11 inches long	25.00
" 15 " "	31.25
Automatic power feed for all machines	31.25

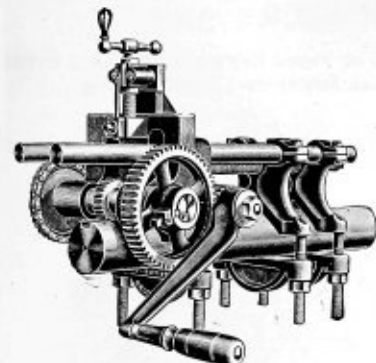
Prices of cutters given upon request.

Nos. 2, 3 AND 4 ARE THE POPULAR SIZES

In ordering or writing for prices, give diameter of holes, especially those sizes most used, length of hole of hub, especially the longest, width of keyseat, diameter of largest wheel to be keyseated.

Will the countershaft be overhead?

Can also furnish power keyseaters for shafting.



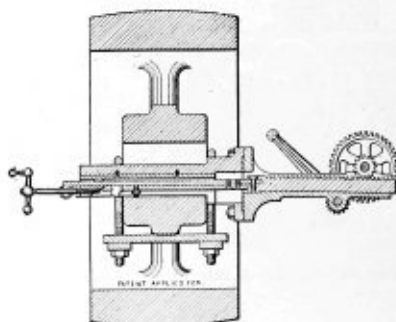
Cut shows No. 1 Machine



No. 2 Keyseater and Countershaft

BURR HAND BORE KEY SEATER

For Cutting Straight or Taper Keyways up to 1½ Inches
Wide in Bores Not Over 12 Inches Long



PORTABLE

Where the work is large or inconvenient to handle, the machine is detached from the base and chucked to the piece to be key seated, as shown above.

Designed for general machine and repair shop work, and is adapted to cut keyways in work of any size, weight or shape. On heavy work it is advantageous to remove the machine from the pedestal and use it as a portable tool as shown above.

Work in all cases is chucked to the bore and hubs need not be faced. The method of chucking is extremely simple, suitable stirrups and binders being furnished with each cutter-bar outfit. Keyways cut on this machine come central with the bore and are ready for keys.

The machine is well built throughout, the first pinion and rack being of machinery steel, and all gears have machine-cut teeth. Its efficiency, general usefulness and ease of operation will commend it to any one having keyways to cut.

The cutter-bars used in this machine consist of the wedge-bar, with its bearing strip always pressed firmly against the channel of the guide-bush and carrying the feed-wedge at its outer end; and the bit bar having the cutter fastened to its outer end. These two bars are fastened together at the inner, or tool post end, and the feed is obtained by inserting the feed-wedge between them. It will be seen that the cutter has a solid backing at all times between the cutting edge and the channel of the guide-bush, making any retreat of the cutter from the work impossible.

PRICES

The outfit of cutters varies so much in different cases, that we price the machine complete, except tools, which are quoted extra, see below.

Price machine complete, without tools.....\$112.50
Price without base, without tools..... 100.50

CUTTER BARS—(Extra)

Size of Cutter-bar	WILL CUT KEYWAYS		Diameter of Guide-Bush	Price, complete with guide-bush and one cutter	Price Extra cutters, each
	Sizes	Length	Adapted to straight and taper keyways of this diameter and larger		
$\frac{3}{8}$ inch	$\frac{1}{8}$ to $\frac{7}{8}$ inch	6 inches	1-inch diameter	\$15.00	\$2.25
$\frac{5}{8}$ inch	$\frac{3}{8}$ to $\frac{5}{8}$ inch	12 inches	1 $\frac{1}{8}$ -inch diameter	18.75	3.00
1 $\frac{1}{2}$ inch	$\frac{3}{4}$ to 1 $\frac{1}{2}$ inch	12 inches	3 $\frac{1}{4}$ -inch diameter	22.50	3.75

An outfit of cutter-bars covering the range of keyways from ¼-inch to 1½-inches wide consists of one each of the above sizes.

THE FORBES PIPE THREADING MACHINES FOR HAND OR POWER

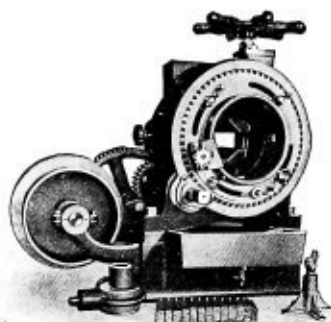
One man can with one of the larger portable hand machines cut off and thread pipe up to twelve inches diameter without assistance, while with the smaller sizes of machine a boy can thread two and three inch pipe with only one hand on the crank.

The dies can be sharpened by grinding without first drawing temper.

In comparing these prices with those of other makes, bear in mind that each machine is a complete tool, with which a pipe can be threaded or cut off without the aid of a vise, and with ease.



No. 56. Hand Machine



No. 76. Hand or Power Machine

MACHINES FOR HAND USE ONLY

No.	Range	Style	WEIGHT, POUNDS		Price with Opening and Adjustable Dies
			Net	Gross	
30	$\frac{3}{4}$ to 2 inch.	R. & L. H.	140	178	\$ 50.00
34	1 to 3 "	R. H.	175	210	75.00
36	$\frac{3}{4}$ to 3 "	L. H.	178	211	85.00
37	$\frac{3}{4}$ to 2 "	R. & L. H.	180	216	105.00
42	1 to 4 "	R. H.	247	295	110.00
44	1 to 4 "	R. & L. H.	260	300	130.00
46	$2\frac{1}{2}$ to 4 "	R. H.	237	287	85.00
50	4 to 6 "	R. H.	330	408	115.00
52	$3\frac{1}{2}$ to 6 "	R. H.	335	413	130.00
56	$2\frac{1}{2}$ to 6 "	R. H.	344	410	175.00
58	1 to 6 "	R. H.	364	437	190.00
60	1 to 6 "	R. & L. H.	387	450	235.00
62	$2\frac{1}{2}$ to 6 "	R. H.	790	944	300.00
63	$2\frac{1}{2}$ to 8 "	R. & L. H.	636	808	360.00
64	$2\frac{1}{2}$ to 8 "	R. H.	648	770	325.00

Above list prices include cutting-off attachment, excepting Nos. 30, 34, 36, and 37 which have no cutting-off attachments unless especially ordered.

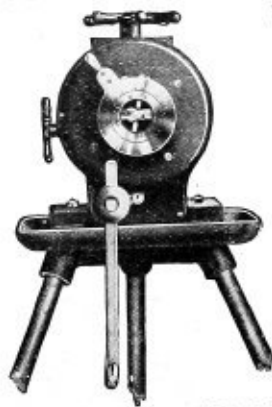
MACHINES ARRANGED FOR HAND AND POWER

No.	Range	Style	WEIGHT		Price with Opening and Adjustable Dies and Countershaft
			Net	Gross	
76	$\frac{3}{4}$ to 3 inch.	R. H.	390	517	\$135.00
77	$\frac{3}{4}$ to 2 "	L. H.	390	536	155.00
78	$\frac{3}{4}$ to 3 "	R. & L. H.	552	684	140.00
84	$2\frac{1}{2}$ to 4 "	R. H.	725	725	160.00
86	1 to 4 "	R. & L. H.	548	716	180.00
88	4 to 6 "	R. H.	658	841	170.00
90	$3\frac{1}{2}$ to 6 "	R. H.	702	888	180.00
94	$2\frac{1}{2}$ to 6 "	R. H.	700	900	225.00
96	1 to 6 "	R. H.	789	1000	250.00
98	1 to 6 "	R. & L. H.	768	950	285.00
98½	1 to 8 "	R. H.	1234	1320	535.00
99	$2\frac{1}{2}$ to 8 "	R. & L. H.	1226	1311	535.00
99½	1 to 8 "	R. & L. H.	1245	1330	570.00
100	$2\frac{1}{2}$ to 8 "	R. H.	1300	1587	590.00
104	$2\frac{1}{2}$ to 10 "	R. & L. H.	2000	2150	790.00
106	$2\frac{1}{2}$ to 10 "	R. H.	2050	2150	750.00
107	$2\frac{1}{2}$ to 12 "	R. H.	3600	3915	900.00
108	$2\frac{1}{2}$ to 12 "	R. & L. H.	4031	4525	1000.00
109	1 to 6 "	R. H.	1875	2085	410.00
110	$2\frac{1}{2}$ to 6 "	R. H.	2120	2475	490.00
112	$2\frac{1}{2}$ to 8 "	R. H.	2400	2658	650.00
114	$2\frac{1}{2}$ to 8 "	R. & L. H.	2600	2680	750.00

Above list prices include cutting-off attachment, excepting Nos. 76 and 77 which have no cutting-off attachments unless especially ordered. Nos. 107 and 108 are especially heavy and powerful.

"OSTER" HAND AND POWER PIPE THREADING MACHINES

With Adjustable Expanding Chasers

**No. 201 Hand Power Machine,**
mounted on Tripod,
with Oil Pan**No. 200-A Power Machine, mounted**
on Tripod, with Oil
Pan

The Die Head has patent, adjustable, quick-opening and closing device.
Double Geared. The die head is driven by double gears.

The Setting Lever is used in releasing the chasers when the thread is cut, in setting them to same size for making duplicate threads, in changing the chasers from one size to another and in setting them to graduation on the faceplate.

Duplicate Threads are cut by replacing the lever in the same notch.

To Change the Chasers, release the setting plate, throw the lever and plate the full limit of travel, and the chasers can be removed outward through the shell.

Chasers for Bolts 7-16 inch to 1½ inches (if not shorter than 9 inches) will be furnished at the same price as regular pipe dies. One set, four pieces, required for each size.

Chasers Cut a full, tapered pipe thread at one cut. There are four pieces to each set, which threads two sizes.

Vise is self-centering and insures straight threads.

When cutting small sizes or the first easy threads of larger pipe, one gear is disengaged and the machine drives fast; when the work becomes heavy, both gears are engaged and the crank turns easily. Thus you get two widely different speeds on the same crank. The change is made in a few seconds, without removing the crank or any other part; no wrench or other tool is necessary.

Chasers for well casting to 4½-inch inside diameter and bolts from ½ to 1½ inches can be added to the regular equipment.

The Adjustable Guides, which are placed just back of the chasers, center and hold the pipe in place while cutting off. No change of equipment is necessary—expand the chasers, bring the guides forward, and the machine is ready for cutting off. One set of guides adjusts to all sizes of pipe.

No. 201 Hand Machine**Threads Pipe ¼ & ¾, ½ & ¾, 1 & 1½, 1½ & 2 inches**
(4 sets of dies)

Description	List Price	Shipping Weight, lbs.
Machine without Base or Tripod	\$60.00	225
Machine mounted on Tripod, with Pan	70.00	235
Machine mounted on cast iron Base, with Pan	80.00	430
Oil Reservoir	3.00	10
Pan to collect Oil and Chips	3.00	.....
Extra Dies per set, four pieces, right or left	3.00	.....

No. 200-A Power Machine**Threads Pipe ¼ & ¾, ½ & ¾, 1 & 1½, 1½ & 2 inches**
(4 sets of dies)

Description	List Price	Shipping Weight, lbs.
Machine with Countershaft	\$100.00	450
Machine mounted on Tripod, with Pan and Countershaft	110.00	520
Oil Reservoir	3.00	10
Extra Dies, per set of four pieces, right or left	3.00	.....

No. 204 Machine, Hand Power, Double Geared**Threads Pipe 1, 1½, 2, 2½, 3, 3½, 4 inches**
(4 sets of dies). Each die cutting 2 sizes.

Description	List Price	Shipping Weight, pounds
Machine, with pan	\$140.00	550
Machine mounted on Tripod and with Pan	150.00	625
Extra Dies, per set of four pieces, right or left hand	4.00	.....

If ½ and ¾ inch chasers are wanted, add \$19.00 to list price of machine

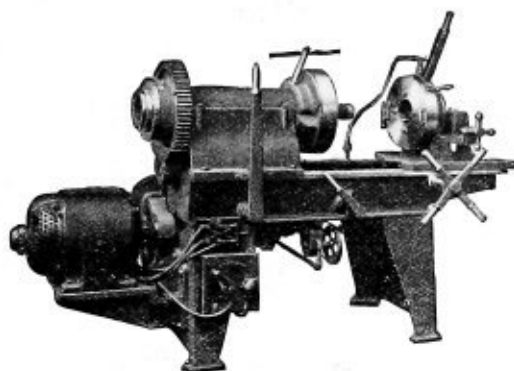
Cone Pulleys have two steps, 8 inch and 12 inch diameter, for 3 inch belt.

Countershaft has tight and loose pulleys, 16 inch diameter, for 3 inch belt.

Speed of Countershaft, 100 revolutions per minute.

Note—The Nos. 201 and 200-A Machines are not equipped with cutting-off attachment.

Automatic cutting-off attachment furnished with above machines.

"WILLIAMS" PIPE AND BOLT THREADING MACHINES**With Quick-Opening Adjustable Dies**

No. 2 Machine
(Motor Driven)

Number	MACHINE Cuts, Inches	REGULAR		SPEED GEAR		EXTRAS			Weight, Pounds	Floor Space, Feet
		Belt, A	Engine, AA	Belt, B	Motor, BB	Dies, Set	Nipple Holders, Each	Nut Chucks, Each		
1	1/4 to 2	\$ 125.00	.....	\$ 215.00	\$ 340.00	\$ 5.00	\$ 50.00	\$ 40.00	1,000	2 x 5
1 1/2	1/2 to 3	315.00	\$ 400.00	340.00	500.00	7.00	60.00	40.00	1,500	2 1/2 x 6
2	1 to 4	470.00	600.00	500.00	665.00	8.00	100.00	50.00	2,400	2 1/2 x 6
3	1 1/2 to 6	590.00	700.00	625.00	815.00	10.00	120.00	50.00	2,600	2 1/2 x 6
4	2 1/2 to 8	825.00	1,030.00	937.00	1,250.00	14.00	200.00	.....	6,500	8 1/2 x 4
5	3 1/2 to 12	1,450.00	1,565.00	1,600.00	1,800.00	24.00	320.00	.....	7,500	9 x 4

A Prices are for Belt driven machines; speeds controlled by stop cone pulley and speed lever.

AA Prices are for Machine and Engine combined.

B Prices are for Machine with Speed Gear, a device through which all speeds are controlled by two levers.

BB Prices are for Machine with Speed Gear and standard make of Constant Speed Motor for direct current, 110 to 500 voltage speed 800 to 1200 r. p. m.

BOLT THREADING ATTACHMENTS

The No. 1 pipe machine will thread bolts 3/8 to 1 1/2 inches by adding 8 sets of bolt dies, at \$2.50 per set, or \$20.00 net, and nuts can also be tapped by adding a nut gripping chuck, at \$20.00 net. Prices on necessary taps given upon request.

The No. 2 pipe machine will also thread bolts by adding the following:

No. 1, Chuck	net \$20.00 extra
" 1, Die Head	" 25.00 "
Eight sets of Bolt Dies, at \$2.50 a set	" 20.00 "
From 1 1/2-inch and up, we can furnish Bolt Dies at	a set, 4.00
Can also tap nuts on this machine from 3/8 to 2 inch by adding Nut Gripping Chuck	25.00

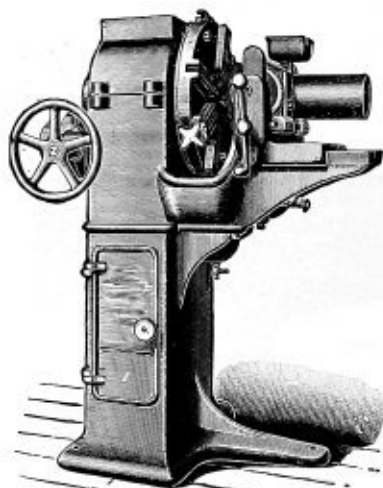
ARMSTRONG PIPE THREADING AND CUTTING-OFF MACHINES

QUICK-OPENING AND
ADJUSTING DIES.

The die-head has no gear teeth on that part of the head that comes in contact with the shell and does not wear loose.

AUTOMATIC CUT-OFF.

All moving parts are protected from dust and chips and run in a bath of oil.



No. 1 1/2. For Power Only
Capacity 1 inch to 4 inches

No. 0.	Machine, Hand, with stand, with pipe dies 1/4 inch to 2 inches Right.....	\$ 70.00
No. 0.	" Power " C/S and stand, pipe dies 1/4 inch to 2 inches Right	113.00
No. 0.	" Hand, with stand, bolt dies, 1/2 inch to 1 1/2 inches Right.....	73.00
No. 0.	" Power, with C/S and stand, pipe and bolt dies.....	158.00
No. 0.	" Attachment, \$15.00 list, Countershaft.....	28.00
No. 0.	" Stand, \$10.00. Extra jaws for 1/4 inch, 3/8 inch, 1/2 inch.....	10.00
No. 00.	" Hand, with stand, pipe dies 1 inch to 4 inches Right.....	148.00
No. 00.	" Power, with C/S, stand, pipe dies, 1 inch to 4 inches Right.....	218.00
No. 00.	" Hand, with stand, bolt dies, 1/2 inch to 2 inches Right.....	150.00
No. 00.	" Power, with C/S, stand, bolt and pipe dies, Right.....	243.00
No. 00.	" Attachment, \$25.00, Countershaft.....	45.00
No. 00.	" Stand, \$20.00, extra jaws for rods, 1/2 inch to 1 inch.....	5.00
No. 1.	" Hand, Right Hand Dies, 1 inch to 3 inches.....	115.00
No. 1.	" Power, " " " 1 " 3 "	170.00
No. 1.	" Hand, " " " 1 1/2 " 3 "	129.00
No. 1.	" Power, " " " 1 1/2 " 3 "	184.00
No. 1.	" Attachment, \$15.00, Countershaft.....	40.00
No. 1 1/2.	" complete for power, with countershaft, right hand dies 1 inch to 4 inches.....	316.00
No. 3.	" " " " " " 1 " 6 "	550.00

Dies used in No. 0 Machine are the same as are used in the No. 2 and No. 3 Armstrong stocks, viz., 1/4 inch to 1 inch, No. 2, and 1 1/4 inches to 2 inches, No. 3.

Dies used in No. 00 Machine are the same as are used in the No. 3 and No. 6 Armstrong stocks, viz., 1 inch to 2 inches, No. 3, and 2 1/2 and 3 inches, No. 6. The 3 1/2-inch and 4-inch die is special.

An adjustable pipe rest is sent with each and every machine.

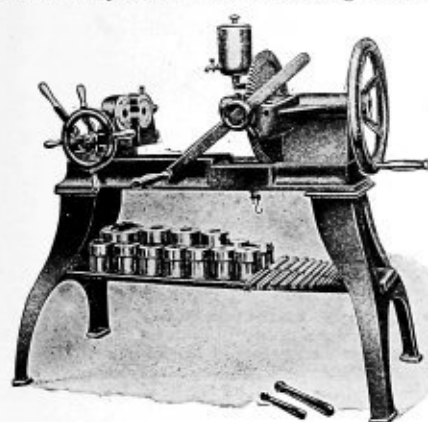
GREEN RIVER, HAND POWER, BOLT-CUTTER, NUT-TAPPER AND PIPE THREADING MACHINE, FIG. 15

Capacity $\frac{1}{4}$ to $1\frac{1}{2}$ Inch for Bolts and Nuts and $\frac{1}{8}$ to 2 Inch for Pipe

Weight, Ready for Shipment, About 700 Lbs.

It has extra heavy gearing which can be thrown in or out at will of operator. This allows both large and small work to be properly cut, and also enables the die to be quickly run off the finished work.

The vise on this machine is constructed with heavy cast steel jaws, carefully hardened and tempered. These steel jaws can be revolved to give three changes, allowing all sizes of iron or pipe to be easily held.



No. 756. Machine complete, with Taps and Dies in Collets for bolts and nuts $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$ and $1\frac{1}{2}$ inch, Chuck, Wrenches, etc. Price..... \$135.00

No. 764. Machine complete, with Taps and Dies in Collets for bolts and nuts, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, and $1\frac{1}{4}$ inch, Chuck, Wrenches, etc. Price..... 120.00

No. 757. Machine complete, with Adjustable Dies in Collets for pipe, right hand, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch. (No Tap Chuck). Price..... 100.00

PIPE SET. Can supply adjustable Pipe Dies and Collets, right hand, $\frac{1}{8}$ to 2 inches, 9 sizes, with assortments. At extra..... 30.00

Holders for using common solid pipe dies with this machine, when desired, each at..... 1.00

Shanks of Collets for dies to fit this machine are 3 inches in diameter.

Will send the Taps and Dies for above, $\frac{1}{2}$ oversize, V thread, unless otherwise ordered. V thread exact size, United States Standard or Whitworth (English) Standard supplied at same price if ordered.

FIG. 45. GREEN RIVER, BOLT-CUTTER, NUT-TAPPER AND PIPE THREADING MACHINE WITH PATENT FRICTION COUNTERSHAFT

Capacity $\frac{1}{4}$ to 2 Inch for Bolts and Nuts, and $\frac{1}{8}$ to 2 Inch for Pipe

It is powerfully back geared. The gears can be thrown out, as in an engine lathe, for small work and also in running back after cutting screws. Has 6 changes of speed; takes $3\frac{1}{2}$ inch belt. Has hollow spindle; hole through spindle, $2\frac{1}{2}$ inches; collets have 3 inch shank.

The vise jaws have 3 changes to enable iron large or small to be properly grasped. The great advantage of this in keeping the jaws sharp and in good order will be appreciated.

Speed of countershaft should be 125 revolutions per minute. Weight of Machine, complete, 1000 lbs.

No. 785. ASSORTMENT 1. Machine complete, with Chuck and Wrenches and Patent Friction Countershaft, 12 inches in diameter, and Taps, Dies and Collets for bolts and nuts $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inches..... \$275.00

No. 786. ASSORTMENT 2. Machine complete with Chuck and Wrenches and Patent Friction Countershaft, 12 inches in diameter, and Taps, Dies and Collets for bolts and nuts $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$ inches..... 257.00

No. 787. ASSORTMENT 3. For Pipe. Machine complete (no Tap Chuck), with Wrenches, Patent Friction Countershaft, 12 inches in diameter, and one right-hand Adjustable Pipe Die and Collet, each $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches..... 245.00

Can supply Adjustable Pipe Dies and Collets, right-hand $\frac{1}{8}$ to 2 inches, 9 sizes, with Assortment Nos. 1 or 2, at extra..... 30.00

Extra for $1\frac{1}{4}$ inch Tap, Die and Collet (for bolts and nuts)..... 12.00

Extra for 2 inch Tap, Die and Collet (for bolts and nuts)..... 14.50

Oil Pump and Tank with flexible tubing connection..... 24.00

Will send the Dies and Taps, for bolts and nuts, for this Machine $\frac{1}{2}$ oversize, V thread, unless otherwise ordered. V thread exact size, United States Standard or Whitworth (English) Standard supplied at same price if ordered.

If plain countershaft, having tight and loose pulleys, 12 inches in diameter, is wanted, instead of our Patent Friction Countershaft, we can reduce prices on above assortments by..... \$13.00

Oil Tank and Cock for oiling work will be supplied without extra charge, when Oil Pump is not ordered.

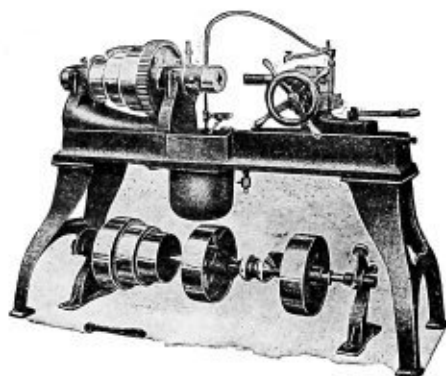
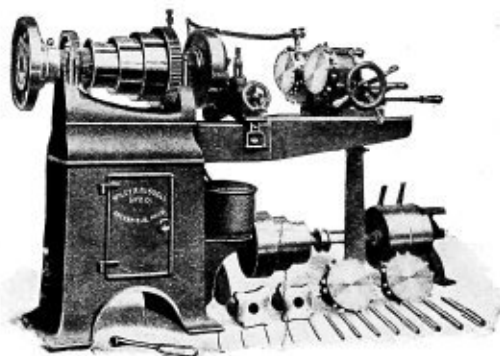


FIG. 55 GREEN RIVER "OPENING DIE" BOLT CUTTER, NUT TAPER, PIPE THREADER AND CUTTING-OFF MACHINE



This Machine has the very great advantage of opening dies which do not need to be adjusted, but stand always ready for work, and instantly release the bolt when threaded, without running back over the screw, thereby saving nearly half the time, and also saving much wear on the dies. By simply turning the hand wheel the dies separate, and the work can be taken out.

Unsurpassed for quickness and convenience in threading bolts or pipe; it is very simple and strong, so that workmen of ordinary skill can use it with good results and without the danger of breaking.

The dies (as many as ten different sizes in assortment No. 1) are secured in two equal disks set side by side, and brought together or separated by a right and left screw, each die being divided, the half in one disk opposite to the half in the other, in such a manner that a complete working die is made by bringing the wheels together

to the stops, and the finished screw released by separating them, thus saving running back over the threads. Each die has independent stop-pins controlling its cut, which are readily shortened or lengthened, enabling a perfect adjustment to be maintained, all the different dies standing ready for use, so that any size may at once be brought into position by turning the disks to the proper places, thereby making it possible to thread a lot of bolts of different sizes almost as quickly as if all were of the same size. Each die cuts a full thread at one operation, and the hollow spindle allows a screw of any desired length to be cut.

The chuck is a very complete one. The jaws being made of tool steel, hardened and tempered, have three changes of size to enable iron, large or small, to be properly grasped, thereby keeping the jaws sharp and in good order.

The capacity of this machine is for bolts, nuts or pipe $\frac{1}{4}$ to 2 inches. It is powerfully back geared; has six changes of speed, which are obtained by throwing gears in and out, as in an engine lathe, thus making it possible to get suitable speed or power, as the nature of the work may require. Has hollow spindle; hole through spindle $2\frac{1}{2}$ inches; takes $3\frac{1}{2}$ -inch belt.

Speed of countershaft should be 125 revolutions per minute. Weight complete, 2,000 lbs.

Oil tank and cock for oiling work will be supplied without extra charge when oil pump is not ordered.

No. 800. Assortment A, suitable for threading bolts and nuts $\frac{1}{4}$ to $1\frac{1}{2}$ inches (14 sizes). MACHINE, with chuck, nut-holders and wrenches only.....	\$300.00
PLAIN COUNTERSHAFT, having one tight and one loose pulley, 12 inches in diameter, for right hand threads only.....	15.00
SET NO. 1, consisting of one pair die-holders with dies and taps adjusted, for bolts and nuts $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch.....	39.15
SET NO. $1\frac{1}{2}$, consisting of one pair die-holders, with dies and taps adjusted, for bolts and nuts $1\frac{1}{4}$, $1\frac{1}{2}$ and $1\frac{3}{4}$ inches.....	38.50

Machine complete, as above.....\$392.65

No. 801. Assortment B, suitable for threading bolts and nuts, $\frac{1}{4}$ to $1\frac{1}{2}$ inches, and pipe $\frac{1}{4}$ to 2 inches (22 sizes). MACHINE, with chuck, nut-holders and wrenches only.....	\$300.00
PLAIN COUNTERSHAFT, having one tight, one loose pulley, 12 inches in diameter, for cutting right hand threads only.....	15.00
SET NO. 1, consisting one pair die-holders, with dies and taps adjusted, for bolts and nuts $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch.....	39.15
SET NO. $1\frac{1}{2}$, consisting of one pair die-holders, with dies and taps adjusted, for bolts and nuts $1\frac{1}{4}$, $1\frac{1}{2}$ and $1\frac{3}{4}$ inches.....	38.50
SET NO. 5, for pipe, consisting of one pair die-holders, with right hand pipe dies, as follows: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches.....	37.10

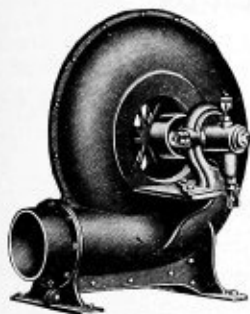
Machine complete, as above.....\$429.75

CUTTING-OFF ATTACHMENT. For cutting off pipe or bars in front of chuck. This swings back out of the way when not in use. Extra.....25.00

SCROLL CHUCK. When long pipe or bars are to be threaded, we would recommend this extra chuck on back end of spindle. For short work this chuck is unnecessary. Extra.....25.00

Machine complete, as above.....\$479.75

STEEL PRESSURE BLOWER FOR CONTINUOUS HIGH PRESSURE

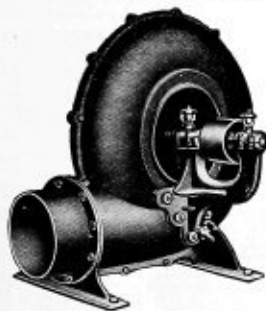


for supplying blast for cupolas, furnaces, forge fires, sand blast machines, and for any work requiring the forcing of air long distances, high pressure or strong blast. The blower is right or left hand; and this is indicated by the pulley which (when facing the outlet) is on the right hand side when the blower is right hand and on the lefthand side when the blower is left hand. The various discharges-bottom or top horizontal, or up or down blast-indicate the direction in which blast is taken from the blower and are self explanatory. The prospective purchaser of a blower should consider carefully the desired direction of rotation of same in relation to that of his countershaft or driving pulley. All pressure blowers are furnished in the regular discharge, i. e., bottom horizontal right hand, unless otherwise specified; left hand can be had at same price but an extra 10 per cent will be charged for other discharges.

No. of Blower	Height inches	Diam. of Pulley, inches	Face of Pulley, inches	Inside Diam. of Outlet, inches	Inside Diameter Cupola, inches	Melting Capacity per Hour lbs	Speed Num. of Rev. for Melting Iron	Pressure of Blast, Oz.	Number of Forge Fires	Revolutions per minute for Forge Fires	Price without Countershaft	Price with Countershaft
1/2	12	1 1/8	1 1/8	2 1/2	2 1/2	200	2,000	1	1	4,300	\$ 12.00	\$ 20.00
1	15	2 1/8	2 1/8	3 1/2	3 1/2	400	2,000	2	2	4,200	18.00	28.00
2	20	3	3	4 1/2	4 1/2	800	2,000	4	4	4,000	26.00	38.00
3	24	3 1/2	3 1/2	5 1/2	5 1/2	1,200	2,000	5	5	3,725	36.00	52.00
4	26	3 3/4	3 3/4	6 1/2	6 1/2	1,600	2,000	6	6	3,700	44.00	64.00
5	30	4 1/2	4 1/2	7 1/2	7 1/2	2,000	2,000	7	7	3,375	55.00	80.00
6	35	4 3/4	4 3/4	8 1/2	8 1/2	2,400	2,000	8	8	2,456	70.00	100.00
7	40	5 1/2	5 1/2	9 1/2	9 1/2	2,800	2,000	10	10	2,224	90.00	130.00
8	46	6 1/2	6 1/2	10 1/2	10 1/2	3,200	2,000	12	12	1,814	115.00	170.00
9	53	7 1/2	7 1/2	11 1/2	11 1/2	3,600	2,000	14	14	1,619	160.00	230.00
10	64	9	9	13 1/2	13 1/2	4,000	2,270	15	15	1,344	225.00	300.00

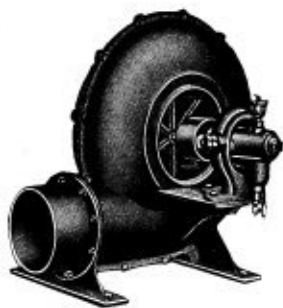
Nos. 1 to 3 have 1 pulley; all other sizes, two pulleys

FAN (VOLUME) BLOWERS AND EXHAUSTERS



Volume Blower

Fan blowers are built especially for use where a large volume of blast is required (instead of great pressure). They are adapted for steam boilers, puddling and heating furnaces, dry rooms, refrigerators, forge fires, ventilation. Two ounce pressure will be sufficient blast for steam boilers, for ventilating. Four ounce pressure will give good results on puddling and heating furnaces. The number of forge fires given in table can only be considered as a guide, as all depends



Exhaust Fan

on the size of fires wanted and in what location the blower is placed. The best results are obtained when blower is close to the fires, and elbows especially short turns, are avoided.

EXHAUST FANS

They are especially adapted for ventilating refrigerating, removing dust from sand and emery wheels, rag and cotton pickers, grain elevators, buffing machines used by shoe manufactures, exhausting smoke and gas from blacksmith shops, etc.

No. of Blower	Height, inches	Inside Diameter of Inlet, inches	Inside Diameter of outlet, inches	Diameter of Pulley, inches	Face of Pulley, inches	Revolutions per Minute 2-oz. Blast For Boiler Fires	Revolutions per Minute 4-oz. Blast For Forge Fires	Number of Forge Fires	Price, Each
1/2	12	4 1/2	3 1/2	2 1/2	1 1/4	3,300	4,500	1	\$ 12.00
1	15	5	4	3	2	3,000	4,000	2	15.00
2	18	5 1/2	4 1/2	3 1/2	2 1/2	2,600	3,600	4	20.00
3	21 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2,300	3,300	6	25.00
4	25 1/2	7 1/2	6 1/2	5 1/2	4 1/2	1,928	2,682	9	33.00
5	29 1/2	9	7 1/2	6 1/2	5 1/2	1,628	2,279	15	44.00
6	34	10 1/2	8 1/2	7 1/2	6 1/2	1,410	1,961	18	55.00
7	40	12	10 1/2	9 1/2	7 1/2	1,194	1,692	24	70.00
8	45	14	12	11 1/2	8 1/2	1,018	1,417	30	90.00
9	50	16	14	13 1/2	9 1/2	878	1,234	40	150.00
10	57	18	16	15 1/2	10 1/2	766	1,065	52	200.00



CHAMPION BLOWERS

This blower is intended for blowing fires in portable and small stationary boilers, also for forge fires and various purposes where a small current of air is desired.

No. 0.	Blower, 16 inches high, will blow	one fire.....each,	\$ 8.00
No. 00.	" " " " "	two ordinary fires....."	10.00
No. 000.	" " " " "	three " ""	12.00
Arranged for exhaust purposes, extra.....			2.00

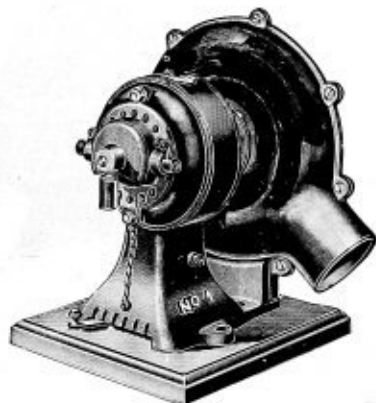
ELECTRIC BLOWERS

Before ordering a Blower driven by electricity it is very necessary to understand that two distinctly different currents are supplied by practically all electric plants, and therefore, a purchaser of an electrically driven Blower must get the following information from the plant that manufactures the electric current :

- 1st. Find if the current is direct or alternating.
- 2d. If direct current it is necessary that you find the voltage only.
- 3d. If alternating current, you must find cycles or alternations and voltage.
- 4th. 60 cycles or 7200 alternations furnished regularly.
- 5th. Both currents will be furnished regularly for either 110 or 220 volts.
- 6th. Other cycles or voltages are special and require correspondence.

CHAMPION ONE-FIRE VARIABLE SPEED ELECTRIC BLACKSMITH BLOWERS

This special One-Fire Variable Speed Electric Motor is a specially designed motor for blacksmiths' use. It has five (5) different speeds which gives the mechanic five (5) different blasts, which will meet every requirement from a light fire to a fire that will put a welding heat on a 4-inch axle in the shortest possible time.



No. 1 Champion One-Fire Variable Speed Electric Blacksmith Blower with Five Speeds, Weight 35 lbs. Price \$36.00

CHAMPION DIRECT-CONNECTED ELECTRIC BLOWERS

These Direct-Connected Electric Blowers are regularly manufactured in two sizes, representing Nos. 2 and 4 Fan Blowers.

The number of forge fires given in the table below can only be considered as a guide to go by, as it all depends on the size of the fires wanted, and in what location the Blower as well as the forges are placed. The best results are obtained when the blower is close to the fires and elbows or especially short turns are avoided. To get the highest results out of a blower run by a one speed motor such as is required for a blower running more than one fire, it must be understood that there are times in electric plants in many cities when they are drawn upon practically to their limit for current, and at



No. of Blower	Height in inches	Inside Diameter of Inlet	Inside Diameter of Outlet	No. of Forge Fires	Phase	Cycles	Alternations	Volts, Direct and Alternating Currents.	Price, Direct Current	Price, Alternating Current
12	18	31	31	1	Single	60	7200	110 or 220	\$ 50.00	
13	18	31	31	1	Single	60	7200	110 or 220		\$55.00
14	18	31	31	1	Single	60	7200	110 or 220	100.00	
15	18	31	31	1	Single	60	7200	110 or 220		115.00

3 1/8-inch Blast Gate, the size required for Blacksmith Fires \$1.50



IMPERIAL FILES

**BEST REFINED
CRUCIBLE STEEL**

H.Channon Company
Chicago.

WARRANTED EXTRA QUALITY PERFECT IN TEMPER AND WORKMANSHIP

BUFFALO ELECTRIC BLOWERS

For Forge Fires

This electric driven Blower is a compact, powerful and efficient blowing outfit for forge fires. The motors are self-oiling and absolutely dust proof, but are equipped with end covers which are easily removable, permitting inspection of the brushes, etc. Motor is direct connected to blower, no bearings being used on blower whatever.



Steel Pressure Type

No. of Blower	Height in inches	Dia. of Outlet and Inlet in inches	Voltage	Cycles	Rev. Per Minute	Approx. Weight	No. of Forge Fires	List Price Direct Current	List Price Alternating Current
00	11	2 3/4	110	60	1700	35	1		\$ 34.00
00	11	2 3/4	110	220	1800	35	1	\$ 34.00	
1	12	3 1/2	110	220	3400	60	1-2		56.00
1	12	3 1/2	110	220	3400	60	1-2	50.00	
2	15	4	110	220	3400	100	2-4		72.00
2	15	4	110	220	2800	100	2-3	64.00	
3	19	4 5/8	110	220	3400	150	3-5		110.00
3	19	4 5/8	110	220	3000	150	3-4	96.00	

NOTE. Speed regulators are furnished with direct current motors. Blast Gates are furnished with alternating current motors.

CHAMPION DISC WHEEL

The blades are made of special rolled steel and mechanically fit into a grooved hub, where they are securely fastened. The shaft is made from hammered steel, extra length, so pulley can be placed on either side, and thus prevent cross belts. The wheel runs entirely noiseless, and is guaranteed to give perfect satisfaction.

In ordering the disc wheel or exhauster, be sure to mention what they are to be used for and amount of work they are to do. State on which hand the pulley is wanted, i. e., whether on the side the air is going in or out.

Diameter of Wheel, Inches	Diameter of Pulley, Inches	Face of Pulley, Inches	Price Each	Diameter of Wheel, Inches	Diameter of Pulley, Inches	Face of Pulley, Inches	Price Each
18	4	2	\$ 40.00	48	9	4	\$125.00
24	4	2	50.00	54	9	4	175.00
30	6	2	65.00	60	10	5	250.00
36	7	3	85.00	72	12	5 1/2	300.00
42	8	3 1/2	110.00	84	14	6	350.00



CHAMPION BLAST GATES

2 inch iron	Each, \$ 1.00
2 1/2 " " "	" 1.25
3 " " "	" 1.50
3 1/2 " " "	" 2.00
4 " " "	" 2.25
5 " " "	" 2.50
6 1/2 " " "	" 3.50
8 1/2 " " "	" 5.00
10 " " "	" 6.50
12 " " "	" 8.00
14 " " "	" 12.00
16 " " "	" 16.00
18 " " "	" 18.00
20 " " "	" 21.00
24 " " "	"

Above are outside measurements

STEEL PLATE BLOWER

They are used for heating, drying, ventilating, and in places where the greatest number of cubic feet of air is required, the proportions and shaft being in every way calculated to handle a great volume of air. The running parts are proportioned for strength and durability for use where it is important to have a strong and reliable machine. We furnish these fans arranged either for exhausting or blowing purposes; either right or left hand.

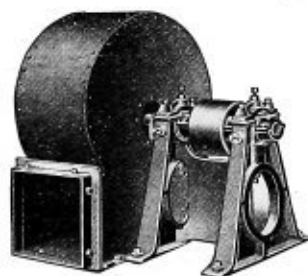


Height in inches	Inside Size of Outlet in inches	Inside Diameter of Inlet	PULLEYS		Average Speed	Capacity Cubic Feet of Air at 1 ounce Pressure	Price Each
			Diameter	Face			
50	18½x18½	24¾	9	7	693	11,440	\$125.00
60	22¼x22¼	26½	10	8	650	16,120	175.00
70	26 x26	31¼	11	9	509	22,880	225.00
80	29¾x29¾	39⅞	12	10	426	30,160	275.00
90	33½x33½	43	14	11	376	39,000	300.00
100	37¼x37¼	45¾	16	12	340	48,360	400.00

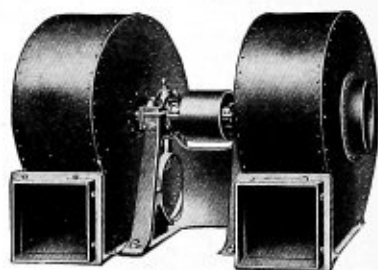
SINGLE AND DOUBLE STEEL PLATE PLANING MILL EXHAUST FANS

For removing shavings, chips and sawdust from woodworking machinery, and for elevating cotton, cotton seed, hulls, etc., or any other fibrous material of the same nature. The bearings are both placed on one side, leaving the inlet unobstructed, so as to allow free ingress for such materials. The blast wheel or blast wheels are made almost entirely of steel, and so constructed that the machine cannot become clogged by the catching or lodging of any matter passing through it.

SINGLE EXHAUSTER



DOUBLE EXHAUSTER

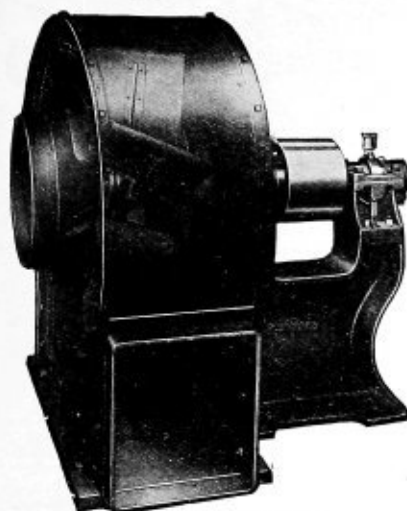


Size, inches	Height of Shell, inches	Inside Diameter of Inlet, inches	Inside Diameter of Outlet, inches	SINGLE EXHAUSTERS		DOUBLE EXHAUSTERS	
				Diameter and Face of Pulley, inches	Price Each	Diameter and Face of Pulley, inches	Price Each
30	30	11	11	5¼x5	\$ 55.00	6x6	\$ 90.00
35	35	13	13	6 x 6	70.00	7x7	100.00
40	40	15	14¾	6¾x6¾	90.00	8x8	130.00
45	45	17	16⅞	8 x 7½	115.00	9x9	170.00
50	50	19	18¾	8½x8½	150.00	10x10½	210.00
55	55	21	20½	9½x9½	185.00	11x11	275.00
60	60	23	22¾	10¾x10	200.00	12x11¼	325.00

Built bottom horizontal, top horizontal and upright discharge.

CYCLOIDAL SHAVINGS EXHAUSTERS

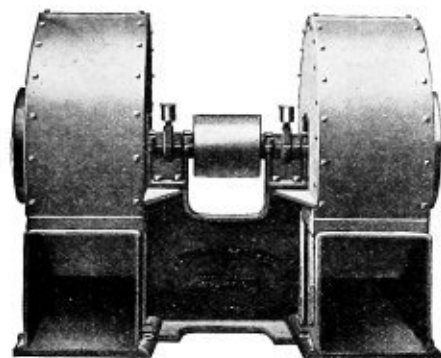
STEEL PLATE CONSTRUCTION.



SINGLE. (Right hand)

Slow Speed
Economy of Power
High Efficiency

Light Running
Increased Durability
Chain Oiling Bearings



DOUBLE. (Bottom horizontal discharge)

Price List Steel Plate Cycloidal Single Shavings Exhausters

Size, inches	Price	Diameter of Inlet, inches	Width and Height of Outlet, inches	Size of Pulley	Revolutions per minute	Weight in lbs.
25	\$ 45.00	10	10 x 10	7 x 4	1700 to 2000	300
30	50.00	12	11 x 10	7 x 4	1600 " 1900	350
35	65.00	14	12 x 13	8 x 5	1300 " 1700	400
40	80.00	15	13 x 14	9 x 6	1200 " 1500	600
45	100.00	17	14 x 16	10 x 7	1100 " 1350	750
50	130.00	19	16 x 18	11 x 7	900 " 1200	1000
55	165.00	21	17 x 20	13 x 8	825 " 1050	1200
60	195.00	23	18 x 23	15 x 8	750 " 950	1550
70	275.00	26	21 x 28	16 x 10	675 " 875	2600
80	360.00	30	24 x 36	18 x 12	560 " 700	2900

Built top horizontal or vertical up discharge. All housing bolts exterior to casing and easy of access.

Price List Steel Plate Double Cycloidal Shavings Exhausters

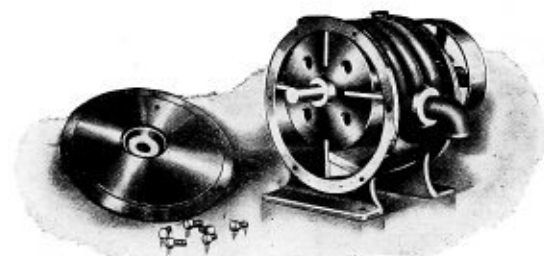
Size, inches	Price	Diameter of Inlet, inches	Diameter Main Discharge Pipe	Width and Height of Outlet, inches	Size of Pulley	Revolutions per minute	Weight in lbs.
30	\$ 90.00	12	16	11 x 10	7 x 6	1600 to 1900	600
35	100.00	14	19	12 x 13	8 x 7	1300 " 1700	800
40	127.00	15	22	13 x 14	10 x 8	1200 " 1500	1100
45	165.00	17	24	14 x 16	10 x 8	1100 " 1350	1350
50	215.00	19	27	16 x 18	11 x 10	900 " 1200	1700
55	270.00	21	30	17 x 20	13 x 10	825 " 1050	2000
60	320.00	23	32	18 x 23	15 x 12	750 " 950	2700
70	440.00	26	37	21 x 28	16 x 12	575 " 875	4700
80	600.00	30	43	24 x 36	18 x 12	560 " 700	5000

Built also top horizontal or vertical up discharge when specially ordered.

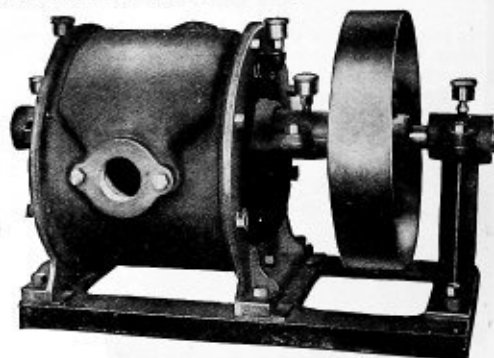
These Fans, when properly piped, require less power and run nearer noiseless than other types of fans of same size.

H.Channon Company. Chicago.

"U. S." POSITIVE PRESSURE BLOWERS



No. 1/4 x Interior



No. 2 Blower

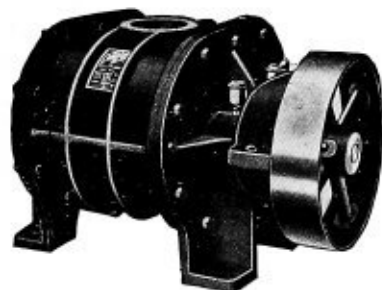
Note interior view above, showing simplicity of construction. The impellers or wings are always flush with the inner shell, therefore even positive pressure is supplied. There are no internal gears to get out of line, or worn or to rattle, and the impellers can be replaced by anyone capable of taking off one side of blower and slipping them in place. Pressure is 1 to 3 lbs.

No.	Price	Cu. Ft. per Min.	Speed, R. P. M.	Outlet, Inches	Size of Pulley	Gross Weight, Lbs.	HORSE POWER REQUIRED AT		
							1 Lb. Press, H. P.	2 Lbs. Press, H. P.	3 Lbs. Press, H. P.
1/4	\$ 25.00	32	400 to 450	1	8x2	60	1/2	3/4	1
1/4 x 1/2	37.50	41	400 to 450	1 1/4	10x2 1/2	95	3/4	1 1/8	1 1/4
1/2	43.75	50	375 to 425	1 1/2	10x2 1/2	135	1 1/2	2	2 3/4
1	56.25	72	325 to 375	1 1/2 to 2	12x3	215	2 1/2	3 1/2	4 1/2
2	81.25	114	300 to 350	2 to 2 1/2	14x3	245	3 1/2	4 1/2	5 1/2
3	118.75	150	275 to 325	3 to 3 1/2	16x3 1/2	380	4 1/2	5 1/2	6 1/2
4	187.50	232	250 to 300	4 to 5	18x5	470	6 1/2	7 1/2	8 1/2

Loose Pulleys extra \$2.50 for first 3 sizes and \$3.00 extra for others.

CONNERSVILLE ROTARY POSITIVE PRESSURE BLOWERS

For Gas and Oil Furnaces, Brazing, Sand Blast, Laundries, Forge, Etc.



The casing and revolving parts are made of the best grade of soft grey iron, the shafts are of steel and pressed into place and pinned, the gears are cut from the solid blank on an improved gear cutting machine and are fitted and pinned to the shaft. The bearings are of bronze, drilled and grooved for oiling. The inlet and discharge openings are tapped for standard pipe connections. All parts are interchangeable and repairs can be furnished promptly.

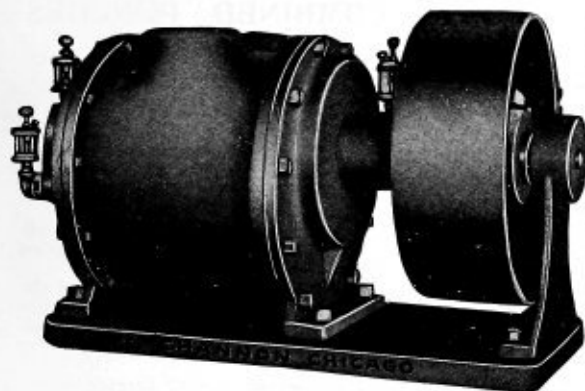
Power Required

The power required is proportional to the pressure and speed and is based on 1/2 horse power to discharge 100 cubic feet of free air per minute against a pressure of 1 pound per square inch.

No.	Displacement per Revolution, Cu. In.	Diameter Outlet, In.	Speed	Pulley	Shipping Weight	Price, with One Pulley	Price with Tight and Loose Pulleys
35	173	2 1/2	800 to 1500	7x1 1/2	90	\$20.00	\$21.50
40	288	2 1/2	500 to 900	8x2	135	40.00	42.00
50	576	3	300 to 600	10x2 1/2	200	70.00	72.50

No. 35. Hand Blower. Price.....\$20.00
Standard machines are built for top discharge, but can be made for bottom discharge if desired.
When running at full speed these blowers make very little noise.

NOISELESS POSITIVE BLOWERS



FOR FOUNDRIES, SMELTERS, GAS EX-HAUSTERS, PNEUMATIC CARRIERS, ETC.

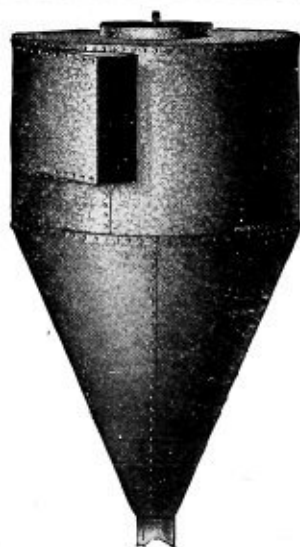
A positive blower, free from all complication of gears and intermeshing pistons or revolvers. It will be seen at a glance that the internal mechanism of the blower is very simple and entirely devoid of pistons, revolvers or gearing, on which contact is absolutely necessary to obtain pressure, as in all other positive blowers, requiring additional power by means of the increased friction, also careful attention and frequent adjustment.

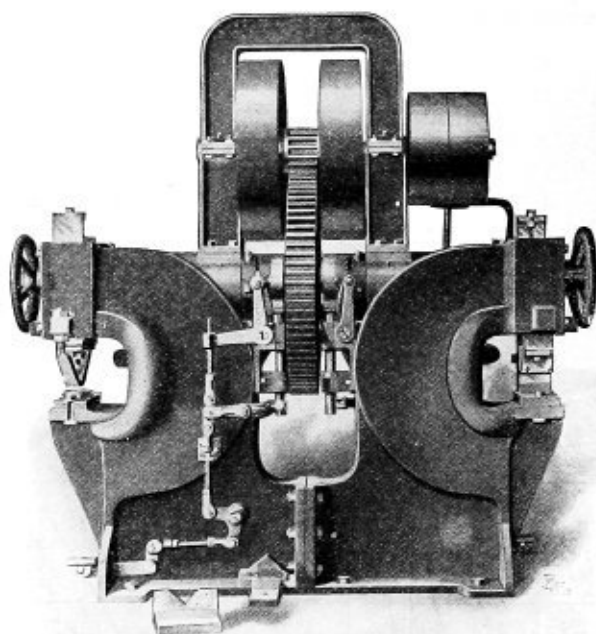
Size No.	Diam. Inlet and Outlet, Inches	Diam. and Width of Blower Inside, Inches	Discharge per Rev.	Speed	Cu. Ft. per Min.	H. P. at 3 Lbs.	H. P. at 5 Lbs.	H. P. at 10 Lbs.	Size of Driving Pulley, Inches	Weight of Blowers, Lbs.	Number of Brazing Fires	Size of Cupola, Inches	Floor Space, Extreme Inches	Price
00	1	7 x 3	70 cu. in.	400	16	$\frac{1}{2}$	$\frac{2}{3}$	$1\frac{1}{2}$	8 x 3	45	2	...	14 x 8	\$ 37.50
0	$1\frac{1}{2}$	9 x 4	170 " "	350	35	$\frac{3}{4}$	1	2	10 x 3	115	4	...	18 x 10	43.75
x	2	10 x 6	$\frac{1}{2}$ " ft.	300	75	1	2	4	12 x 3	170	6	...	20 x 12	68.75
$\frac{1}{2}$	$2\frac{1}{2}$	10 x 9	$\frac{3}{4}$ " "	300	112	$1\frac{1}{2}$	3	6	12 x 4	225	8	...	29 x 12	87.50
$\frac{1}{4}$	3	12 x 10	$\frac{1}{2}$ " "	250	188	3	$4\frac{1}{2}$	9	14 x 4	350	12	...	26 x 14	125.00
$\frac{1}{2}$	5	18 x 12	$1\frac{1}{2}$ " "	200	350	$4\frac{1}{2}$	$7\frac{1}{2}$	15	20 x 5	650	20	...	36 x 18	187.50
1	8	24 x 15	4 " "	175	787	10	15	30	24 x 6	1,200	...	18 x 24	40 x 24	250.00
2	10	24 x 24	7 " "	175	1,225	15	25	50	26 x 6	1,700	...	24 x 30	50 x 24	375.00
3	12	36 x 24	10 " "	150	1,500	20	32	65	44 x 6	4,250	...	30 x 36	72 x 36	468.75
4	14	36 x 36	16 " "	150	2,400	30	50	100	44 x 8	5,480	...	36 x 42	96 x 36	612.50

CYCLONE DUST COLLECTORS

The use of the Dust Collector on any fan system permits the fan to work to its utmost capacity without consuming an inordinate amount of power.

No.	Fan Capacity of Inlet, Sq. Inch	Size of Inlet, Inches	Diam. Air Outlet, Inches	Depth Tub. Guard, Inches	Diam. Dust Outlet, Inches	Diam. Cylinder, Inches	Height Cylinder, Inches	Height Cone, Inches	Price List
4	12	7 x 2	8	8	2	24	12	24	\$ 15.00
6	28	10 x 3	12	10	4	30	15	30	40.00
8	50	13 x $4\frac{1}{2}$	16	13	6	42	21	42	80.00
10	78	16 x 6	20	16	10	50	28	50	125.00
12	113	17 x 8	24	17	10	54	30	54	175.00
14	154	20 x 8	26	20	10	58	36	63	200.00
16	201	23 x 9	28	23	10	62	40	70	225.00
18	254	26 x 10	32	26	10	66	44	74	250.00
20	314	29 x 11	36	28	10	72	48	80	275.00
22	380	32 x 12	40	30	10	78	52	88	350.00
24	452	38 x 12	44	32	12	84	56	96	400.00
26	530	42 x 13	46	36	12	90	60	104	475.00
28	615	44 x 14	50	36	12	96	64	112	550.00
30	706	48 x 15	52	38	12	102	68	120	600.00
32	814	52 x 16	56	40	12	108	72	128	700.00





DOUBLE HEAD COMBINED PUNCHES AND SHEARS

8 TO 36 INCH THROATS

Well designed, strong and substantial. Can be equipped with adjustable automatic stop if desired, also with base for electric motor drive.

All style of attachments for working structural steel shapes supplied promptly.

The movement of the ram is of the cam pintle type, in which there is very little wear, and the gib, which is adjustable for taking up the wear, is of phosphor bronze.

The shaft is a special forging, properly machined. The main gear and pinion are cast from cut gear patterns, to insure smooth running.

The automatic stop is simple and positive; the jaws of the clutch are lined with tool steel, so that the wear on the jaws does not injure the main part of the clutch or gear.

Strippers and hold-downs are all adjustable, and attachments for architectural jaws are cast steel. Provisions are made in erecting these punches for future electric motor or engine drive.

Style "G" Machine, 8-inch Throat

STYLE "F" MACHINES (Require 7½ H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price with Plain Jaw and Clutch
Capacity.....	10	13,800	\$1,280.00
Punching, 1¼-inch hole in 1-inch steel plate.....	15	16,100	1,480.00
Shearing, ½-inch plate.....	20	18,800	1,650.00
" 6 x 1-inch flat bars.....	24	24,100	2,100.00
" 2-inch diameter round bars.....			
" 5 x 5 x ½-inch angles.....			

STYLE "E" MACHINES (Require 6 H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price with Plain Jaw and Clutch
Capacity.....	10	11,600	\$1,154.00
Punching, 1-inch hole in 1-inch steel plate.....	15	13,500	1,290.00
Shearing, ¾-inch plate.....	20	16,900	1,400.00
" 6 x ¾-inch flat bars.....	24	18,000	1,685.00
" 1½-inch round bars.....	30	22,800	1,800.00
" 5 x 5 x ¾-inch angles.....	36	23,400	2,070.00

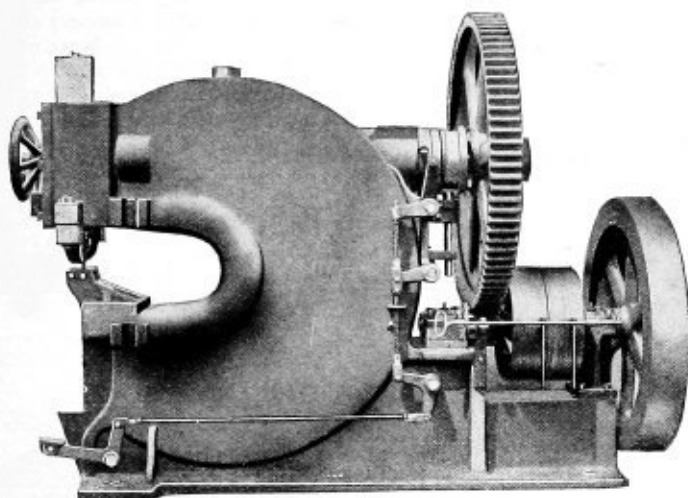
STYLE "G" MACHINES (Require 4 H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price with Plain Jaw and Clutch
Capacity.....	8	7,300	\$ 731.00
Punching, ¾-inch hole in ¾-inch material.....	12	8,200	794.00
Shearing, ¾ x 4-inch flat bars.....	15	9,400	900.00
" 3 x 3 x ½-inch angles.....	20	12,100	1,175.00
" 1½-inch round bars.....	24	14,500	1,440.00
Splitting, ¾-inch steel plate.....	30	17,900	1,775.00
	36	19,900	1,950.00

EXTRA ATTACHMENTS

	Style F	Style E	Style G		Style F	Style E	Style G
Splitting Shears.....	\$ 62.00	\$ 61.00	\$ 47.00	Architectural Jaw.....	\$ 40.00	\$ 39.00	\$ 25.00
Cross-cut.....	54.00	55.00	51.00	Automatic Stop.....	39.00	39.00	16.00
Angle.....	85.00	85.00	54.00	Bevel Shear Attachment.....	185.00	154.00	125.00
Motor Brackets with Cut Gear and Pinion.....	50.00	50.00	72.00				

SINGLE HEAD, INTERCHANGEABLE PUNCHES AND SHEARS



Style "F" Machine with 24-inch Throat and Automatic Stop

STYLE "F" MACHINES (Require 7½ H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price with Plain Jaw and Clutch
Capacity.....	10	7,300	\$ 619.00
Punching, 1¼-inch hole in 1-inch plate.....	15	8,200	750.00
Shearing, 7/8-inch plate.....	20	10,450	895.00
" 6 x 1-inch flat bars.....	24	13,000	1,200.00
" 2-inch diameter round bars.....			
" 5 x 5 x 1/8-inch angles.....			

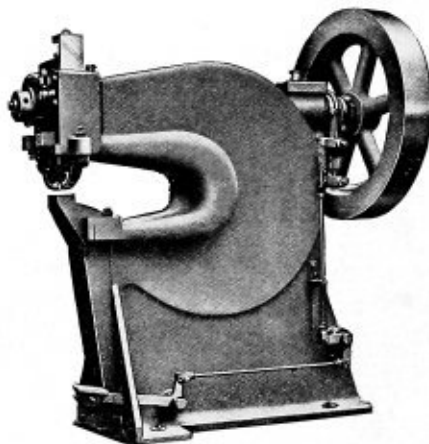
STYLE "E" MACHINES (Require 6 H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price
Capacity.....	10	6,100	\$ 540.00
Punching, 1-inch hole in 1-inch steel plate.....	15	7,800	695.00
Shearing, 3/4-inch plate.....	20	8,900	780.00
" 6 x 7/8-inch flat bars.....	24	10,100	932.00
" 1¾-inch round bars.....	30	12,400	1,100.00
" 5 x 5 x 3/8-inch angles.....	36	14,700	1,325.00

STYLE "G" MACHINES (Require 4 H. P. Motors—1100 R. P. M.)

SPECIFICATIONS	Depth of Throat, Inches	Weight, Lbs.	Price
Capacity.....	8	3,750	\$ 424.00
Punching, 3/4-inch hole in 3/4-inch plate.....	12	4,900	474.00
Shearing, 3/4 x 4-inch flat bars.....	15	5,635	525.00
" 3 x 3 x 1/8-inch angles.....	20	6,500	693.00
" 1½-inch round bars.....	24	7,995	790.00
Splitting 5/8 steel plate.....	30	9,400	870.00
	36	11,200	1,035.00

Extra attachments same as Double Machines.



STYLE "L" RAPID ACTION PUNCH

Cut shows machine fitted with an architectural jaw, but other attachments may be fitted to it, such as bar and round iron shear, angle shear or splitting shear. Is equipped with adjustable automatic stop so operator can bring machine to a stop at any point of stroke. A brake in front of face plate will stop punch at proper point after release of clutch. All punch and shear blocks, clutch and strippers are made of steel, and main eccentric shaft a steel forging.

Throat	Punch	WILL SHEAR				Weight	Price
		Flat	R'd	Plates	Angles		
10	$\frac{1}{2} \times \frac{1}{2}$	$3 \times \frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{8}$	$2 \times 2 \times \frac{3}{8}$	1800	\$252.00
15	$\frac{1}{2} \times \frac{1}{2}$	$3 \times \frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{8}$	$2 \times 2 \times \frac{3}{8}$	2250	300.00
18	$\frac{1}{2} \times \frac{1}{2}$	$3 \times \frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{8}$	$2 \times 2 \times \frac{3}{8}$	3100	345.00
24	$\frac{1}{2} \times \frac{1}{2}$	$3 \times \frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{8}$	$2 \times 2 \times \frac{3}{8}$	4500	475.00

COMBINED STAKE RIVETER AND PUNCH

Our machines of this style are equipped with adjustable automatic stops which enable operator to bring punch to a stop at any point of stroke. All rivets are put in from top. An automatic hold up clamps sheets before rivet is headed.

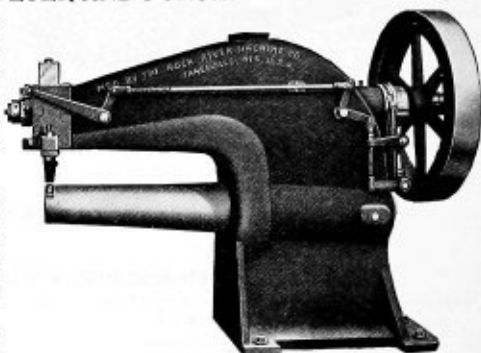
One punching and one riveting attachment with wrenches and strippers are furnished with each machine. The stake and main eccentric shaft are carbon steel forgings.

The machine should make about 80 strokes per minute.

From 20% to 30% more work can be done with these machines than with a pneumatic riveter, and a skillful operator can do from 75% to 90% more work with a Stake Riveter than can be done by hand riveting in the same length of time.

These machines cannot be excelled for working on hot water boilers, riveting pipes, conveyors, coal chutes, smoke stacks, etc.

Extra stakes for smaller diameter of pipes can be furnished.



Length Stake	Diam. Stake	Riveting Capacity	Punching Capacity	H. P.	Weight	Price
8	6	$\frac{1}{4}$	$\frac{3}{8} \times \frac{3}{8}$	2	2850	\$ 338.00
20	8	$\frac{3}{8}$	$\frac{1}{2} \times \frac{3}{8}$	$3\frac{1}{2}$	5800	700.00
30	9	$\frac{3}{8}$	$\frac{1}{2} \times \frac{3}{8}$	$3\frac{1}{2}$	6800	740.00
36	10	$\frac{3}{8}$	$\frac{1}{2} \times \frac{3}{8}$	.....	7500	775.00
50	12	$\frac{3}{8}$	$\frac{1}{2} \times \frac{3}{8}$	.....	12500	1040.00
62	14	$\frac{3}{8}$	$\frac{5}{8} \times \frac{1}{2}$	.....	16000	1385.00

Punching and riveting attachments furnished with each machine.

No. 42 BOILER MAKERS' HAND POWER PUNCH

Equipped with Structural Jaw for working angles, channels, etc.

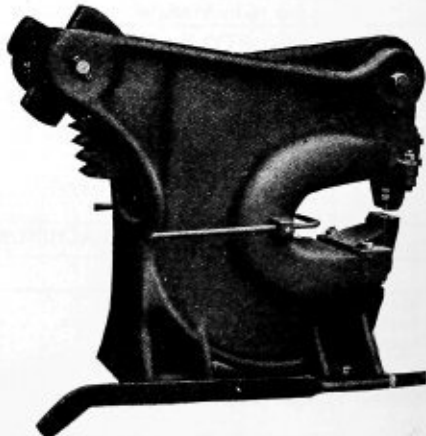
Will punch $\frac{3}{4}$ in. hole in $\frac{1}{2}$ in. steel plate.

Will punch to the center of 31 in.

Weight of this machine 2500 lbs.

Machine may be fitted with Plain Jaw.

Number	Depth Throat	Punch	Weight	Price
24	24	$\frac{1}{2} \times \frac{1}{8}$	2200	\$160.00
42	15	$\frac{3}{4} \times \frac{1}{2}$	2500	185.00
44	36	$\frac{3}{4} \times \frac{1}{2}$	4400	316.00





PELS PORTABLE HAND POWER PUNCHES

Made of Steel Plates, Unbreakable

For large warehouses or outdoor work these machines are very useful.

Contractors often place them on platform cars; can be left in the open air without damage as they have no complicated parts.

The machines listed are especially designed for punching flanges of beams and channels.

The outfit consists of 1 punch, 1 flat and 1 bevel die for maximum capacity.

No.	CAPACITY		Height of Beams to be Punched in Flanges	Depth of Throat	Approximate Weight	Price, Portable	PRICE OF EXTRA		
	Diameter of Hole	Thickness of Material					Punches	Dies	Bevel Dies
0	$\frac{3}{8}$ in.	$\frac{3}{8}$ in.	From 4 in. up to 8 in.	10 in.	374 lbs.	\$156.25	\$1.25	\$1.25	\$2.50
1	$\frac{3}{4}$ in.	$\frac{3}{8}$ in.	From 4 in. up to 10 in.	11 in.	594 lbs.	187.50	1.25	1.25	2.50
2	1 in.	$\frac{1}{2}$ in.	From 5 in. up to 12 in.	12 in.	902 lbs.	256.25	1.25	1.50	3.25
3	1 $\frac{1}{8}$ in.	$\frac{7}{16}$ in.	From 5 in. up to 15 in.	13 in.	1232 lbs.	300.00	1.50	1.75	3.25

WERNERS' BAR CUTTER FOR HAND POWER

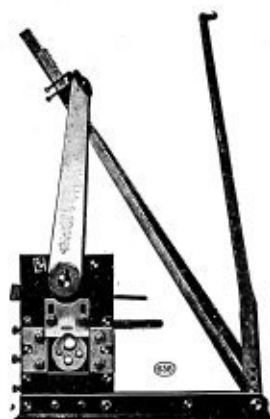
An indestructible cut-off tool. The knives can easily be changed for the different shapes. They combine utmost rigidity with light weight and compactness. The cut is clean, and the work is done easily.

Largely used for cutting off high-carbon concrete reinforcing bars.

No.	CAPACITY					Approximate Weight	Machine without Knives	Knives, Round, Square, Angles or Tees, per Set	Made Portable Extra
	Round	Square	Flat	Angles	Tees				
10	$\frac{1}{8}$ in.	$\frac{1}{8}$ in.	$\frac{1}{8}$ in., $\frac{5}{16}$ in.	$\frac{1}{8}$ in., $\frac{1}{4}$ in.	$\frac{1}{8}$ in., $\frac{1}{4}$ in.	198 lbs.	\$118.75	\$26.25	\$27.50
14	$\frac{1}{4}$ in.	1 in.	$\frac{1}{4}$ in., $\frac{1}{2}$ in.	2 in., $\frac{1}{4}$ in.	$\frac{1}{4}$ in., $\frac{1}{2}$ in.	330 lbs.	150.00	30.00	32.50
17	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	2 in., $\frac{1}{2}$ in.	3 in., $\frac{1}{2}$ in.	$\frac{1}{2}$ in., $\frac{1}{2}$ in.	462 lbs.	187.50	35.00	43.75
21	$\frac{3}{4}$ in.	$\frac{3}{4}$ in.	$\frac{3}{4}$ in., $\frac{1}{2}$ in.	$\frac{3}{4}$ in., $\frac{1}{2}$ in.	$\frac{3}{4}$ in., $\frac{1}{2}$ in.	770 lbs.	218.75	42.50	52.50
26	2 in.	2 in.	6 in., $\frac{1}{2}$ in.	4 in., $\frac{1}{2}$ in.	4 in., $\frac{1}{2}$ in.	1276 lbs.	262.50	57.50	66.25



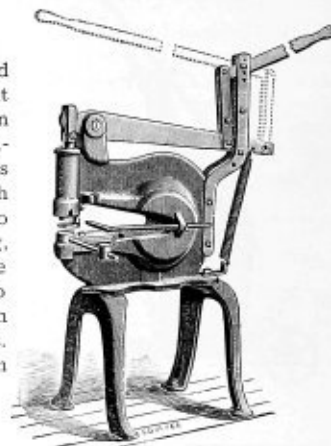
Showing Different Knives Which Can be Used with the Bar Cutters



Bar Cutter with Knives for Round Bars

COMPOUND LEVER SHEET IRON PUNCHES, 15-INCH THROATS

Operated by either treadle or overhead lever. Lever arranged to work from front or back. Steel plunger, wrought iron lever, adjustable back gauge and an adjustable side pin gauge for punching holes equal distances apart. $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$ -inch punches and dies furnished, or larger up to $\frac{3}{8}$ inch (larger sizes extra). In ordering, state size of punches and whether treadle or overhead lever is desired. Top lever to work front or back for \$1.50 extra. With both treadle and lever for \$6.00 extra net. To punch $\frac{3}{8}$ in $\frac{1}{8}$ and heavier requires an extension on treadle.



No. 136.	To Punch	$\frac{3}{16}$ in	Weight,	350 Lbs.	Price, \$47.00
No. 137.	"	$\frac{1}{4}$ in	"	400 "	" 52.00
No. 138.	"	$\frac{5}{16}$ in	"	425 "	" 56.00
No. 139.	"	$\frac{3}{8}$ in	"	500 "	" 62.00
No. 140.	"	$\frac{7}{16}$ in	"	800 "	" 75.00
No. 141.	"	$\frac{1}{2}$ in	"	1000 "	" 87.00

COMBINED PUNCHES AND SHEARS, HAND POWER



No.	Throat, inches	Will Punch	Blade, inches	To Cut	Bars	Round	Weight	Price
2	4	$\frac{3}{4}$ in	10	No. 12	$\frac{1}{4} \times 1$	$\frac{3}{8}$	240	\$ 50.00
3	6	$\frac{1}{2}$ in	10	No. 10	$\frac{1}{4} \times 1\frac{1}{2}$	$\frac{1}{2}$	300	56.00
4	8	$\frac{1}{2}$ in	15	No. 10	$\frac{1}{4} \times 2$	$\frac{3}{8}$	450	68.00
5H	10	$\frac{1}{2}$ in	15	No. 8	$\frac{3}{8} \times 2$	$\frac{5}{8}$	575	78.00
5	12	$\frac{1}{2}$ in	12	No. 8	$\frac{3}{8} \times 2$	$\frac{5}{8}$	525	75.00
6	8	$\frac{3}{8}$ in	12	No. 6	$\frac{1}{2} \times 2\frac{1}{2}$	$\frac{3}{4}$	640	87.00
8	12	$\frac{3}{8}$ in	12	$\frac{1}{4}$ inch	$\frac{1}{2} \times 3$	$\frac{3}{4}$	800	100.00
10	18	$\frac{3}{8}$ in	18	No. 10	$\frac{1}{2} \times 2\frac{1}{2}$	$\frac{5}{8}$	1050	118.00
10A	15	$\frac{3}{8}$ in	15	No. 6	$\frac{1}{2} \times 3$	$\frac{3}{4}$	1150	131.00
12	15	$\frac{1}{2}$ in	12	$\frac{5}{8}$ inch	$\frac{5}{8} \times 2\frac{1}{2}$	$\frac{7}{8}$	1200	143.00
12B	12	$\frac{1}{2}$ in	12	$\frac{1}{2}$ inch	$\frac{5}{8} \times 3$	$\frac{7}{8}$	1275	152.00
18	20	$\frac{1}{2}$ in	24	$\frac{1}{2}$ inch	$\frac{1}{2} \times 3\frac{1}{2}$	$\frac{7}{8}$	1850	200.00
18C	20	$\frac{5}{8}$ in	24	$\frac{3}{8}$ inch	$\frac{5}{8} \times 3\frac{1}{2}$	1	2100	212.00
18D	18	$\frac{3}{4}$ in	24	$\frac{3}{8}$ inch	$\frac{5}{8} \times 4$	1	2200	218.00

Write for Discount. When ordering, state size of Punches desired.

No. 12 and larger sizes will be furnished with an extra 9-in. top blade for trimming $\frac{1}{8}$ and $\frac{3}{16}$ plates.

The following items are extra net:

With Lever Socket on each side, as shown on large cut, to operate Punch from front or back, on No. 2 and No. 3, \$1.50; Nos. 4, 5, 6, 8 and 10, \$2.00; No. 12, \$2.50; No. 18 and larger, \$3.00. Punches $\frac{3}{8}$ -in. and larger, or special square Punches, also Blades fitted to cut angle iron, furnished for the proper difference in price.

COMBINED PUNCHES AND SHEARS--HAND POWER

No. 15 MACHINE

Has three pairs of knives: one for cutting flat bars, one for round iron, and one for band iron, also three punches and dies and lever for operating.

CAPACITY

Punching $\frac{3}{8}$ -inch hole in $\frac{1}{2}$ -inch plates.

Shearing 1-inch round bars.

" $\frac{1}{2}$ x4 inch flat bars.

" 7x $\frac{1}{4}$ inch band iron.

Will punch to center of 14-inch circle.

Weight, 800 lbs.....Price, \$81.00

Can also be furnished with angle shearing attachment, extra.



No. 15



Style of Nos. 6 and 33

No. 33 MACHINE

CAPACITY

Punching $\frac{3}{8}$ -inch hole in $\frac{3}{8}$ -inch plate.....

Shearing $\frac{3}{4}$ -inch diameter round iron

" $\frac{1}{2}$ x2 $\frac{1}{2}$, or $\frac{3}{8}$ x3 inch flat bars.....

Will punch to center of 6-inch circle.

Weight, 310 lbs.

Price, \$37.00

No. 6 MACHINE

CAPACITY

Punching $\frac{1}{2}$ -inch hole in $\frac{1}{2}$ -inch plate.....

Shearing 1-inch diameter round iron

" $\frac{1}{2}$ x4 inch flat bars.....

Will punch to center of 6-inch circle.

Weight, 510 lbs.

Price, \$65.00

BOILER MAKERS' HAND LEVER PUNCHES



Illustration Shows No. 8 1-2 Punch

TINNERS' PUNCHES



No. 5

No.	Throat, Inches	Will Punch	Weight	Price
8 $\frac{1}{2}$	5	$\frac{3}{8}$ in. hole in $\frac{3}{8}$ in.	214	\$ 40.00
28	10	" " " "	450	64.00
29	15	" " " "	750	87.00
31	18	" " " "	875	118.00

No.	Capacity, Diameter of Hole in Thickness of Plate	Depth of Throat	Weight, Lbs.	Price
5	$\frac{3}{8}$ -in. hole in $\frac{1}{8}$	15	95	\$29.00
25	$\frac{1}{4}$ " " " $\frac{1}{4}$	10	180	29.00

No. 1. HANDY PUNCH

Will punch $\frac{1}{4}$ -inch hole in $\frac{1}{4}$ -inch plate, to the center of a 5-inch circle.

Weight, 70 lbs.Price, \$13.75

Price includes three punches and dies.

No. 1. HANDY SPLITTING SHEAR

For Tinnern, Etc.

Will shear $\frac{1}{8}$ -inch sheet metal and less, any length or width.

Weight, 65 lbs.

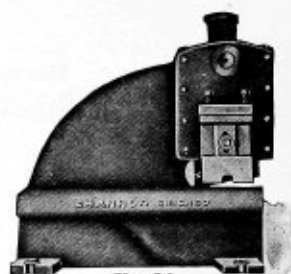
Price, \$16.50.

No. 3. COMBINED SPLITTING SHEAR AND ROD CUTTER

Will shear $\frac{1}{8}$ -inch sheet metal any width or length.

Will shear $\frac{1}{2}$ -inch diameter round iron or less.

Weight, 120 lbs.Price, \$22.00

Nos. 30 and 40. SPLITTING SHEARS**No. 30**

No. 30. Will shear $\frac{1}{4}$ -inch plates or less, any width or length. Shear blade $6\frac{1}{2}$ inches.

Weight, 240 lbs.Price, \$44.00

No. 40 $\frac{1}{2}$. Will shear $\frac{3}{8}$ -inch plates or less, any width or length. Shear blade $7\frac{1}{2}$ inches.

Weight, 700 lbs.Price, \$80.00

**BADGER No. A3
ANGLE SHEAR**

Cuts $1\frac{1}{4} \times \frac{1}{8}$ angle iron.

Weight, 165 lbs.

Price, \$32.50.

**A-1****BADGER FLAT BAR AND
ROUND IRON SHEARS**

The operator stands before his work, the lever working towards instead of away from him. Light iron can be adjusted with one hand and cut with the other.

FLAT BAR SHEARS

A1. Will shear $\frac{3}{8} \times 3$ inch flat bars.
Weight, 75 lbs.Price, \$13.00

A2. Will shear $\frac{1}{2} \times 2$ inch flat bars.
Weight, 150 lbs.Price, \$19.50

**COMBINED FLAT BAR AND ROUND IRON
SHEARS**

A1 $\frac{1}{2}$. Will shear $\frac{3}{8} \times 3$ inch flat bars and $\frac{3}{4}$ -inch diameter round bars.
Weight, 90 lbs.Price, \$16.00

A2 $\frac{1}{2}$. Will shear $\frac{1}{2} \times 2$ inch flat bars and $\frac{1}{4}$ -inch diameter round bars.
Weight, 165 lbs.Price, \$25.50

No. 20 MARVEL PORTABLE PUNCH

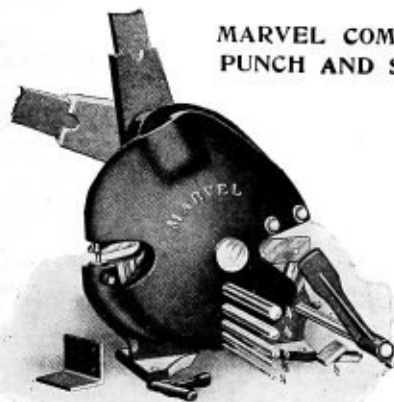


Made entirely of steel. No castings. Capacity $\frac{1}{4}$ -inch hole in $\frac{1}{4}$ -inch stock. Depth of throat, 2 inches. Weight, 16 lbs. Length over all, 38 inches.

Price, including one $\frac{1}{4}$ -inch Punch and Die... \$14.50

Can furnish extra punches and dies, sizes $\frac{1}{8}$ to $\frac{1}{2}$ inch.

MARVEL COMBINED PUNCH AND SHEAR



Made of malleable iron; has double lever; blades, punches and dies made of best tool steel, all parts are interchangeable.

Equipped with double or compound eccentrics, one through the other, and one attached to each lever-socket. The inside lever is short, for light, quick work, and has a pin that locks both sockets, and at the same time the two eccentrics together, thus working as a single eccentric. When thus locked the outside or long lever may also be inserted if more leverage is desired. For heavy work the small lever is turned half around in the socket, which unlocks sockets and eccentrics, and immediately by bringing forward long lever, the power is tremendously increased, and in this manner the operator can take a long or short swing with the long lever, with a pumping motion if desired, the short lever being brought forward each time the long lever is raised, which gives the long lever a new bite in the cut or punch, without moving the work.

Cuts { Up to $\frac{1}{2}$ x 2 inch, Flat.
 $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$, Round.
 Angle Iron in 2 cuts up to $\frac{1}{4}$ x2x2.

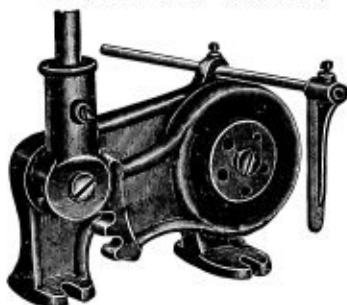
Punches { $\frac{3}{8}$ inch hole in $\frac{3}{4}$ inch stock.
 $\frac{1}{2}$ " " " " " "

Throat, 2 $\frac{1}{2}$ inches. Flat shear blades, 3 $\frac{3}{4}$ inches long.

Price complete with 2 steel levers, 3 punches, 3 dies and gauge for flat and round shearing. Weight, 155 lbs. ... \$41.00

Price as above, and fitted with heavy iron legs. Weight, 210 lbs. 45.00

MARVEL ROD CUTTER



Cutting Dies have round openings of correct size to cut off rods and wire within the capacity of the machine, which insures good work with ends round and true.

No. 5. Cuts Rods $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{2}$ inches and intermediate sizes. Weight, 12 lbs.

Price complete with lever, gauge and gauge rod, \$6.00

No. 6. Cuts Rods $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{2}$ inches and intermediate sizes. Weight, 35 lbs.

Price complete with lever, gauge and gauge rod, \$10.00

No. 7. Cuts Rods $\frac{7}{8}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{8}$ inches and intermediate sizes. Weight, 95 lbs.

Price complete with lever, gauge and gauge rod, \$22.00

MARVEL MULTIPLE PUNCHES



No. 10. Has 4 Punches, one each $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$ inches.

No. 11. Has 4 Punches, one each $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inches.

No. 12. Has 3 Punches, one each $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ inches.

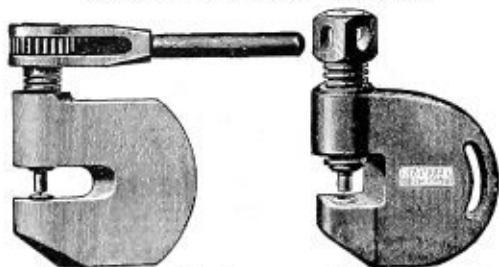
One punch is used at a time, all the punches may be left in place at all times if desired. The punches are simply dropped in place and the steel block shown with thumb screw can be rapidly shifted over any punch desired and punch tightened by turning the thumb screw.

No.	Throat Depth	Capacity	Weight, lbs.	Price Each
10	4 in.	$\frac{1}{8}$ Hole in $\frac{1}{4}$ in. stock	90	\$ 30.00
11	5 " "	$\frac{3}{8}$ " " $\frac{3}{8}$ " "	300	65.00
12	6 $\frac{1}{2}$ " "	$\frac{1}{2}$ " " $\frac{1}{2}$ " "	675	110.00

H.Channon Company. Chicago.

BOILER MAKERS' SCREW PUNCHES

CAST STEEL SCREW PUNCHES



With Ratchet Head

With Bar Head

DROP FORGED SCREW PUNCHES

Light, Stiff and
Powerful, with Bar
Head or with
Ratchet Head



Cut Shows Bar Head

CAST STEEL PUNCHES

No.	CAPACITY		Will Punch from Edge of Sheet, inches	Weight, lbs.	Price Each	Add for Ratchet Head	Extra Punches and Dies, Per Pair
	Diameter of Hole Punched, inches	Thickness of Plate, inches					
A	$\frac{5}{16}$	$\frac{1}{4}$	$1\frac{1}{2}$	15	\$20.00	\$15.00	\$3.50
B	$\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{2}$	17	24.00	15.00	3.50
C	$\frac{1}{2}$	$\frac{5}{16}$	$1\frac{1}{2}$	27	30.00	15.00	4.00
D	$\frac{3}{4}$	$\frac{1}{2}$	$2\frac{1}{4}$	40	40.00	15.00	4.00
E	$\frac{3}{4}$	$\frac{3}{4}$	3	60	60.00	15.00	5.00
G	$\frac{3}{4}$	$\frac{3}{4}$	4	110	80.00	15.00	5.00

One Punch and Die Furnished with Each Tool FORGED STEEL PUNCHES

No.	CAPACITY		Will Punch from Edge of Sheet, inches	Weight, lbs.	Price Each	Add for Ratchet Head	Extra Punches and Dies, Per Pair
	Diameter of Hole Punched, inches	Thickness of Plate, inches					
1	$\frac{1}{2}$	$\frac{5}{16}$	$1\frac{1}{2}$	20	\$16.00	\$15.00	\$2.00
2	$\frac{3}{4}$	$\frac{3}{8}$	$2\frac{1}{2}$	48	25.00	15.00	2.50
3	$\frac{3}{4}$	$\frac{3}{4}$	$3\frac{1}{4}$	70	32.00	15.00	2.80
4	$\frac{3}{4}$	$\frac{3}{4}$	4	100	40.00	15.00	2.80

One Punch and Die Furnished with Each Tool

HYDRAULIC PUNCHES



HEAD PUNCHES

Fitted with a pinion
meshed into a rack cut
on the ram, to withdraw
punch from metal after
punching.



BEAM PUNCHES

No. 1 Punch

Throat 9 inches deep by $7\frac{1}{4}$ inches, allows a beam to be punched close to the flange, or 9 inches from edge. It also allows T-iron to be punched lengthwise through the punch.

Capacity, 1-inch hole in 1-inch iron.

No. 1. Weight, 650 lbs. Price.....\$225.00

No. 2 Punch

Throat $12\frac{1}{2}$ inches deep by 9 inches high. The edge of the jaw is only $1\frac{1}{4}$ inches from the edge to the center of the die. Will punch beams on flanges and webs.

Capacity, 1-inch hole in 1-inch iron.

No. 2. Weight, 800 lbs. Price.....\$275.00

No.	CAPACITY		Will Punch from Edge of Sheet, inches	Weight, lbs.	Price
	Dim. of Hole Punched, inches	Thickness of Plate, inches			
1	$\frac{5}{8}$	$\frac{3}{8}$	$1\frac{3}{4}$	50	\$ 60.00
2	$\frac{3}{4}$	$\frac{1}{2}$	2	85	85.00
$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	5	130	100.00
3	$\frac{3}{4}$	$\frac{3}{4}$	$2\frac{1}{4}$	130	120.00
$3\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$4\frac{1}{8}$	180	140.00
4	1	$\frac{3}{4}$	$2\frac{1}{2}$	160	140.00

JUSTICE HAMMERS

With New Style Rubber Cushions and Oscillating Levers

High degree of speed, equal to any.

The force of blow is particularly heavy for the size of the hammer. Size for size, these hammers will be found to strike a heavier and more effective blow than others rated as of equal size.

CONTROL

Double-ended frictions on the 90-lb. and smaller permit of an unusually excellent control. The larger sizes we have generally made with the belt tightener, which takes hold harder and swings the heavier rams quite efficiently.

ADJUSTMENTS

There is an adjustment for both the length of stroke and also for the distance between the dies, the adjustment being readily made for any class of work.

Cut of 90-Lb. Hammer

Size	Revolutions per Minute	Size of Iron Adapted to Work to Best Advantage, Inches	Horse Power Required to Run	Weight, About, Lbs.	Price Each
Actual Weight of Ram without Die, Lbs.					
55	325	14x13 1/4 or less	1	2600	\$ 450.00
90	300	2 1/2 x 2 1/2 " "	2	4500	550.00
130	225	3 x 3 " "	2 to 3	6400	800.00
165	200	3 1/2 x 3 1/2 " "	4 to 5	8360	950.00
300	150 to 180	4 1/2 x 4 1/2 " "	8	13200	1200.00

THE "KERRIHARD" POWER HAMMER

The Kerrihard Hammer is a combination of the helve and direct acting hammer, doing away with the disc helve and pitman and condensing the entire working parts in such a way as to increase the efficiency of both the helve and direct acting features.

The Main Frame and Anvil is in one piece. The entire casting is strong and heavily proportioned with the right amount of metal in the proper place to withstand the jar and shock of continual hammering.

The Head or Ram is machined and gibbed to a machined casting, securely fastened to the main frame, thus making provision for taking up all wear and is adjustable from 3 1/2 to 9 inches and is so arranged that it is always the right distance from the anvil block.

The Eccentric Strap is the best bronze.

All Shafts and Pins subject to wear are hammered steel.

The Clutch is the friction type of new design. It has but three parts and the slightest pressure upon the tread produces the required blow at the operator's will. It releases automatically.

The Spring. There is but one spring in the Kerrihard Hammer and that is the finest crucible steel.

Dies. We furnish with each machine one set of regular dies (lower die is flat; upper one slightly rounding on face), which answer for all ordinary work, but we can furnish any style die at slight additional cost.

No. 1 Hammer

Height over all, inches.....	55
Floor Space, inches.....	18x30
Height of Anvil Block, inches.....	31
Weight of Ram, lbs.....	30
Shipping Weight of Hammer, lbs.....	700
Size of Pulley, inches.....	11
Speed, R. P. M.....	250
Will handle about 2-inch material, round or square.	
One horse power to operate.	
Price.....	\$106.25

No. 2 Hammer

Height over all, inches.....	60
Floor Space, inches.....	22 1/2 x 40
Height of Anvil Block, inches.....	31
Weight of Ram, lbs.....	75
Shipping Weight of Hammer, lbs.....	1250
Size of Pulley, inches.....	11
Speed, R. P. M.....	250
Will handle about 4-inch material, round or square.	
Two horse power to operate.	
Price.....	\$187.50



ROCHESTER HELVE HAMMER



Size "D"

Size	Weight of Head, lbs.	Will Handle Metal Size up to	Aver. No. of Blows per Min.	Height Anvil, inches	Height over all, inches	H. P. Required	Floor Space, inches	Driving Pulley, inches	Shipping Weight, pounds	Price, Inc. 1 Set of Drawing Dies	Price Extra Set Welding Dies
A	25	2 x 2	400	28	44	1 to 2	16x60	13½x4	1250	\$200.00	\$10.00
B	35	2½x2½	400	28	44	2 to 2½	16x60	13½x4	1500	250.00	10.00
C	50	3 x 3	350	28	52	2½ to 3	20x66	15x 5	2550	500.00	12.00
D	60	3½x3½	300	30	54	3½ to 4	24x75	16x 6	3300	600.00	15.00
E	80	4 x 4	275	30	54	4½ to 5	24x75	16x 6	3700	700.00	15.00
F	100	4½x4½	250	30	54	5½ to 6	24x75	16x 6	4200	850.00	16.00

"BOSS" IMPROVED POWER HAMMER

One H. P. Required

The Boss Power Hammer is a useful machine in general repair and blacksmith shops, wagon and buggy factories, mines, shovel factories, etc.

A piece of 1½-inch square iron 6 inches long has been drawn out to 2½ feet with this hammer in one heat. It has welded iron 2 inches thick and as thin as ⅛ inch.

Only the best steel is used for hammer dies, and they are carefully fitted so as to be held firmly in place by means of hand-finished keys. The dies will work to the center of a 24-inch circle and will accommodate material ¾ inches thick extending through the frame, or 6 inches thick lengthwise of the dies. Size of upper die 2 by 4, lower die 3 by 5½.

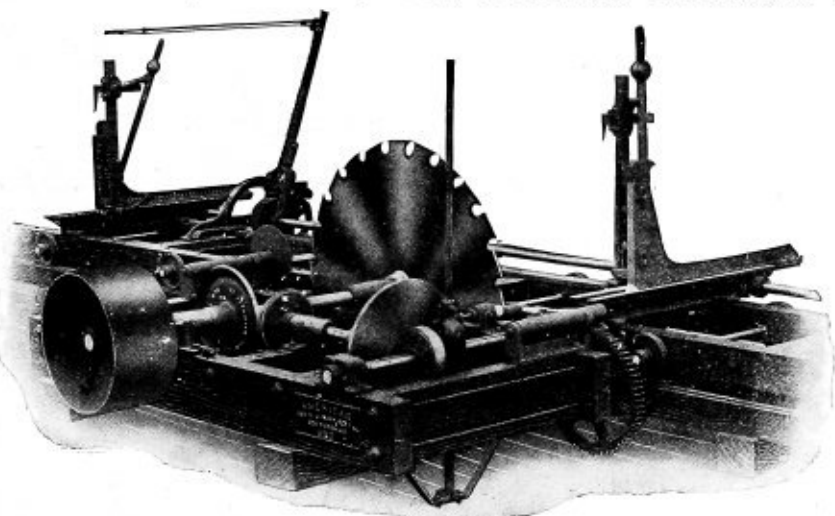


Floor space 24x44 inches, height 6 feet 5 inches, distance between columns 11¾ inches.

Size of drive pulley on crankshaft, 10-inch diameter, 4-inch face; speed 375 per minute.

Weight of hammer-head and die 50 pounds, weight of machine complete with anvil and dies, 1,200 pounds.

Price.....\$200.00

"AMERICAN" IMPROVED VARIABLE FRICTION FEED SAW MILLS

Variable Feed—Bevel Frictions are used as the drivers, insuring a positive motion, reducing the end and lateral thrust and maintaining a wide range of feed variation. The "Gig back" is also positive and will start on the fastest speed without any slipping; it is many times faster than the feed.

Husk Frames are made of selected timber, well bolted together and thoroughly braced. All shafts are turned and ground perfectly true, and run in self-oiling bearings throughout.

Carriages are of selected timber, of sufficient strength to withstand any reasonable load and the hard usage to which saw mill carriages are usually subjected.

Trucks—On all carriages the trucks are of large diameter, fitted with steel axles running in self-oiling babbitted boxes, with ample provision for taking up all lost motion, and are accurately turned to perfectly fit the guide track.

Track furnished is rolled steel in 12-foot sections and furnished with suitable holding down spikes.

Set Works—We usually furnish patented Combination Set Works and Quick Receder, which are accurate and possess many advantages. Two or three pulls of the lever will recede the blocks as far as is usually required. We can also furnish the larger mills with Double Acting Set Works and Spring or Foot Receder as may be ordered.

Carriage Drives—All standard mills are furnished with Rack and Pinion carriage drive, but Manila Rope drive will be supplied, if preferred, without extra charge, or will be fitted with Wire Cable drive at a small additional cost.

Size number.....	No. 1	No. 2	No. 2½	No. 3	No. 4	No. 5
Approx. capacity in feet per day.	2 to 7,000	2 to 10,000	2 to 10,000	4 to 12,000	10 to 20,000	10 to 30,000
Diam. of largest log handled.....	36-inch	40-inch	48-inch	48-inch	54-inch	60-inch

Specifications

No. of Mill	Length of Husk, Feet	Width of Husk, Feet	Size of Husk Timbers, Inches	Diameter of Mandrel	Largest Saw That Can be Used	Mandrel Pulley	Length of Carriage, (Longer Carriages Made to Order), Feet	Length of Rack, Feet	Size of Carriage Timbers	Width of Carriage, Inches	Size of Trucks, Inches	Diameter of Axles	Number of Trucks	Head Blocks Open	Length of Set Shaft, Feet	Length of Track, Steel	Weight, Pounds	Horse Power Required	Price Standard Mill Complete, Except Saw
1	7	3	3 1/2	3 1/2	3 1/2	20 x 10	16	22	3 1/2	26	6	1 1/2	4	34	14	40	2100	6 to 15	\$225.00
2	7 1/2	3 1/2	3 1/2	3 1/2	3 1/2	20 x 10	20	24	3 1/2	30	7	1 1/2	4	38	16	48	3000	6 to 20	270.00
3	8	4	4	4	4	20 x 10	24	28	4	36	8	1 1/2	4	44	18	56	3100	8 to 25	285.00
4	8 1/2	4 1/2	4 1/2	4 1/2	4 1/2	20 x 12	28	32	4 1/2	40	10	1 1/2	4	48	20	64	3400	8 to 25	340.00
5	9	5	5	5	5	20 x 12	32	36	5	44	12	1 1/2	4	52	22	72	4500	15 to 35	400.00
6	9 1/2	5 1/2	5 1/2	5 1/2	5 1/2	24 x 14	36	40	5 1/2	48	14	1 1/2	4	56	24	80	6000	20 to 40	500.00

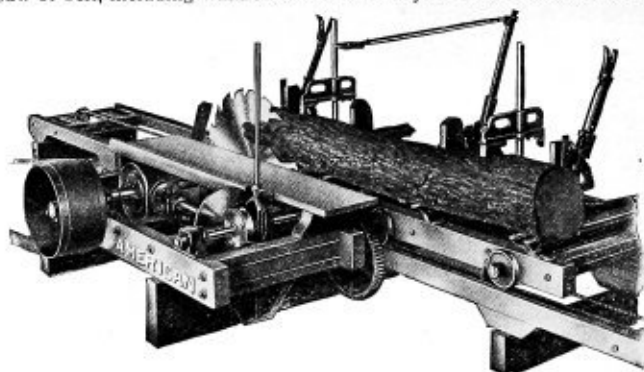
Larger Mills quoted upon request

No. 1 AMERICAN MOUNTED SAW MILL



For portable work and for small settings there is no better or more convenient Saw Mill than this. Suitable for from 6 to 20 H. P. The entire weight is equivalent to a load of about 2,500 lbs. on an ordinary wagon. Shipping weight complete, 4,000 lbs.

Price without saw or belt, including whiffle-trees and neck yoke..... \$365.00



AMERICAN SHORT LOG SAW MILL AND BOLTER

Any kind of short log sawing, making mine or railroad ties, cutting fence posts, either straight or taper, handle stock, shooks, slats, can be handled on this machine. By flitching a log into cuts of desired thickness, and then placing several of these, one on top of the other, on the carriage, thin slats, laths, etc., may be made several at one cut, and very rapidly. For such work we are prepared to furnish special saws of any gauge and size desired. The machine is furnished regularly built as per the following specifications;

Husk Frame 7' x 3' 6"; Timbers 3 1/2" x 7 1/2".
Mandrel 2 1/2" diameter, with 20" x 10" pulley.
Hard Wood table with splitter.
Carriage 8' long, 30" wide, timbers 3 1/2" x 5 1/2".
Three Trucks, with 7" wheels and 1 1/4" axles.
28" track and ways complete.

Foundation timbers as shown for Husk and Track.
Manila Rope Drive with sheaves.
Two Ratchet Headblocks with taper knees.
Two dummy Headblock bases and knees.
Two Double end drop Dogs.
"Ideal" Set Works and Quick Receder.

The headblocks open 24 inches from the saw. They are connected by log beam on which the intermediate knees and dogs are mounted. The position of dummy bases, knees and dogs may be easily changed to adapt the Carriage for cutting special short length stock. Inasmuch as the Rope Drive permits the Carriage to travel at full length of track the Carriage has a maximum travel of 20 feet, and it is possible to cut dimension lumber as long as 16 feet.

A wide variation of feed makes it possible to operate with very small power. We are prepared to furnish pulleys of any size to suit speed of Engine and size of Saw. An extra charge will be made for pulleys over 24 inches in diameter.

Price, including ways and foundation timbers, without Saw or Belt.....\$275.00
Price without foundation timbers..... 265.00
Price without ways or foundation timbers..... 250.00

For mounting on truck add to price \$120.00. Weight, complete, including ways and foundation timbers, 3,000 lbs. Truck, 1,000 lbs. Weight of ways, 450 lbs. Weight of foundation timbers, 350 lbs. Speed 350 to 1,000 r. p. m., depending on power and size of saw. Floor space required, 28 feet x 10 feet. Height of Headblocks from floor, 25 inches.

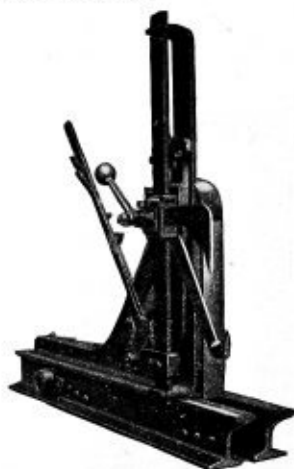
KNIGHT'S NEW "IDEAL" SAW MILL DOGS



Ideal Single Dog

Knight's Ideal Single Mill Dogs are too well known among mill men to require a detailed description of their operation. We wish, however, to call your attention to the improved locking mechanism, controlled by the power lever which automatically locks the dog bit at any point as it is forced into the timber.

The Knight's Ideal Duplex Dog differs from the single dog in that it dogs the log from above and below. The lower dog, which is located between the guide and slide bars, is entirely automatic in its action, no adjustment being necessary to bring it into proper position to hold either log or cant. It is controlled by the power lever and, requiring no extra movement to operate it, can be handled with the same speed as the single dog, making it the best general purpose dog on the market.



Ideal Duplex Dog

KNIGHT'S SPECIAL QUARTER DOG

This dog is designed specially for quarter sawing, but as the upper dog is operated independently may, also, be used as a single dog.

Style and Size	SINGLE DOGS			DUPLEX DOGS	
	Height, Inches	Weight Each, Lbs.	Price per Pair	Weight Each, Lbs.	Price per Pair
No. 1.....	38	70	\$25.00	85	\$ 45.00
No. 2.....	41	95	30.00	110	50.00
No. 3.....	45	125	35.00	130	55.00
No. 3 Special.....	49	140	60.00	150	85.00
No. 4.....	51	195	85.00	235	125.00
Special Quarter Dog.....	49			160	75.00

Directions for Ordering

To avoid delay and insure filling orders correctly, the following information should be given:

Size number, single or duplex, right or left hand. The hand may be determined as follows: On right-hand mills a right-hand dog is used on the front block and a left-hand on the rear or intermediate blocks. On left-hand mills a left-hand dog is used on the front block and right-hand on the rear or intermediate blocks.

THE "AMERICAN" GIANT DUPLEX MILL DOG

Strong, Quick, Simple and Effective

The Main Frame is one piece which is bolted to the head block knee.

The Slide Bar is secured to the main frame, has an up-and-down movement and carries the top dog socket, and is moved by operating lever.

The Top Dog Socket is adjustable to any desired position on the slide bar and carries the dog bit which is adjustable in or out.

The Screw Lever is secured to a large hexagon head screw and firmly secures at any point the sliding socket and dog bit by one motion.

The Lower Dog is independent and has a bar which passes up behind the main slide bar and is also controlled by the operating lever. It is automatic and self-adjusting in its movements.

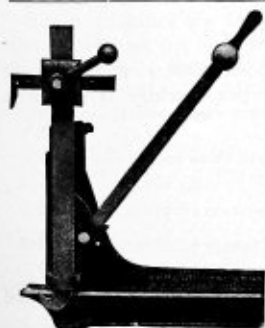
The Operating Lever is securely linked to the main slide bar and is pivoted to the bar of the lower dog, having also a movable fulcrum in the main frame. One motion of the lever moves both top and bottom bits simultaneously.

In operating the dogs, the top dog socket is lowered until the bit touches the log and is fastened to the slide bar by the screw lever. Then by pressing down the operating lever the dog is forced into the timber and the lower dog rises automatically, forcing the lower bit into the timber also.

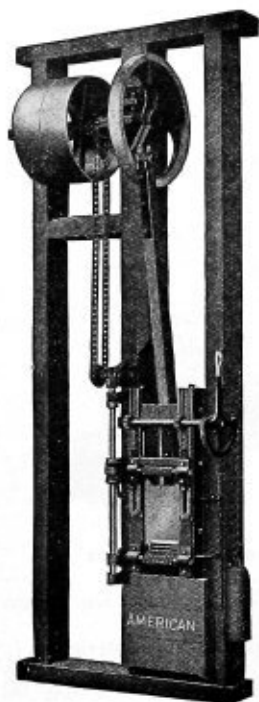
To Release the dogs the operating lever is raised to a vertical position where it is held by a simple catch.

Can be used on any make of mill and is easily attached by simply bolting the main frame to the side of the head block knee. Made in two sizes suitable for any size mill.

No. 1. Weight, 70 lbs. Price each.....\$12.00 No. 2. Weight, 80 lbs. Price each.....\$15.00



AMERICAN EXCELSIOR CUTTING MACHINES



These machines are built throughout of good materials and in the most thorough manner. They are heavy, strong, durable and embody improvements which the experience of practical Excelsior makers and experts in this line have demonstrated as most desirable and necessary in such a machine. They will work equally well hard or soft woods.

The wood frames are constructed of selected timber of ample proportions to withstand the working strains and are carefully mortised and securely bolted together.

The main bearings are heavy, of the bracket chain-oiling type, lined with babbitt and provided with improved screw adjustment for taking up the wear.

The guides are steel and of such form as to insure great strength and accuracy. These together with the feed rolls, cutter plate and other working parts are mounted on a substantial, self-contained, cast iron frame, securing accurate alignment, rigidity and perfect cutting.

The frame which carries the adjustable feed roll is planed to accurately fit the slides on the cast iron frame, preventing side motion and causing the spurs to cut in the same slit in the wood every stroke and **insuring a clean, uniform and superior grade of Excelsior** and making it possible to produce the **finest grades of Wood Wool**.

The slides or bearings on the cutter plate cover a space of about 20 inches and are of such form as to maintain the perfect working of the knife and spurs and permit of all lost motion and wear to be easily and quickly taken up. Lubrication is positive and is distributed the entire length of the guides.

The improved feed is a feature of the machine. The objectionable features of the old style feeds have been eliminated. It is positive, accurate and in easy reach of the operator at all times and is quickly adjusted for all grades of excelsior; the change from one grade to another being made in five minutes or less. These points will be appreciated by practical Excelsior makers.

NOTE—The construction of this machine makes it practicable for those desiring to do so to buy the iron parts only and construct their own wood work from drawings which we can furnish, and thus obtain accurate working machines while saving in first cost and freight.

Machines furnished single, or as many in one frame as desired up to twelve.

Frames 10' high, Floor space 4'2"x12", Tight and Loose pulleys 20"x6", Speed 200 r. p. m. Horse power required for a single machine 5, when mounted in gangs 2 to 3 H. P. per machine is sufficient. Capacity per machine 700 to 1,000 lbs. per day.

Weight of one machine complete as shown, 1,200 lbs.

Weight of Iron parts only for one machine, 750 lbs.

Price of one machine complete as shown and described\$210.00

Price when mounted two or more in one frame, each 204.00

Price of Iron parts only for one machine..... 195.00

One knife, two spur boxes, two sets of spurs and two feed-change gears, suitable for the usual grades of excelsior, go with each machine.

Wood should be cut with square ends from 15½" to 18" long and may be any size up to 6"—Round wood 6" diameter or less need not be split and when straight and free from knots makes a superior grade of excelsior. Machine will be made to take blocks from 10" to 18" long at an additional cost of \$5.00 each.

A cord of wood will make about 2,000 lbs. of Excelsior.

A complete plant consists of the battery of machines, a Wood Splitter, Cut-Off Saw, Baling Press, Knife and Spur Grinder and the necessary power with shafting, hangers, pulleys and belting.

COVEL AUTOMATIC CIRCULAR SAW SHARPENERS

Constructed especially for use in factories where circular saws are used; it will keep the saws perfectly true and evenly ground at all times.

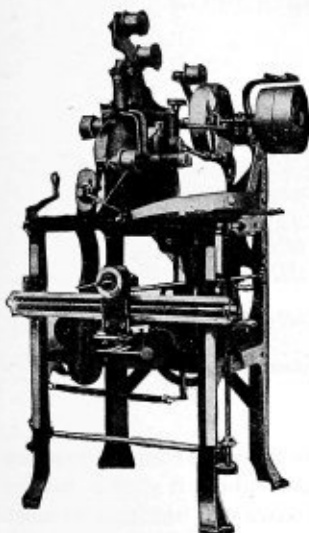
Saws sharpened on an automatic sharpener of this kind will do more and better work by far than saws sharpened by hand sharpener or by filing; then there is a big saving in files, as emery wheels cost but little, compared with files.

Sharpens cross-cut saws bevel on both sides of the teeth, and will sharpen rip saws square, so that they may be swaged if desired.

No.	For Cross-Cut Saws	For Rip Saws	Weight, Lbs.	Price	Extra for Emery Wheel and Belt
40	6 to 22 inch diam.	8 to 24 inch diam.	300	\$100.00	\$3.00
35	8 to 44 " "	10 to 48 " "	750	165.00	5.00
95	12 to 72 " "	16 to 72 " "	1,500	225.00	6.00

We can furnish special centering collar and crosshead for grinding edger without removing the collars. Price, extra \$15.00.

Dimensions of collars to be sent with order.



Cut of No. 40

COVEL AUTOMATIC BAND SAW SHARPENERS

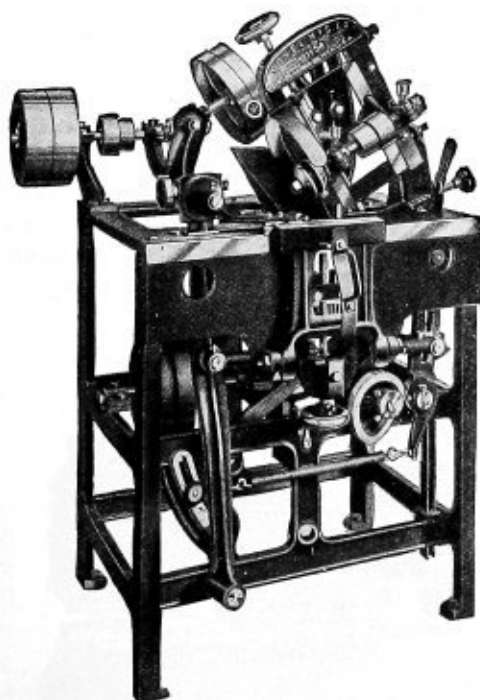
These machines are designed to meet the requirements of different size band saws.

The cut shows a left hand machine—always be sure to state hand of sharpener wanted.

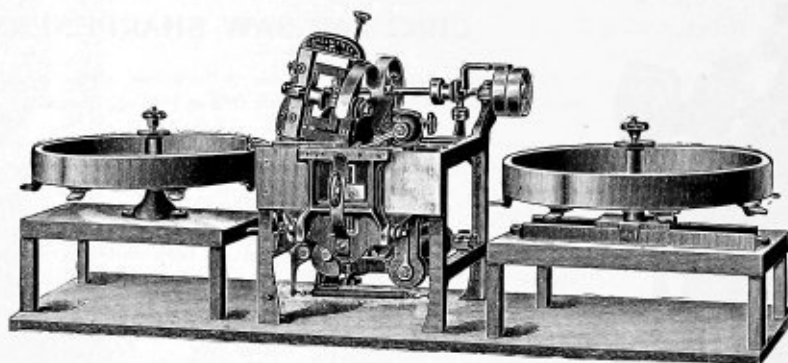
Emery wheel and belts are extra.

No.	For Band Saws	Weight, Lbs.	With Back Feed and Post Brackets
115	4 to 10 inch	1,000	\$150.00
100	6 " 14 "	1,350	225.00
90	8 " 16 "	1,500	275.00
90	8 " 18 "	1,600	300.00
99	12 " 20 "	2,500	350.00

Emery wheel and belts are extra.



Cut of No. 115

No. 66 AUTOMATIC BAND RESAW SHARPENER**Band Resaws, 2 to 6 inches wide**

This machine has all the adjustments essential to making the modern round-throat saw tooth. It can also be set to make a straight face and straight back tooth, if such a tooth is desirable. The straight face tooth is easier to maintain, but the saws will not take as much feed or cut as smooth lumber.

It is furnished with or without pulleys and stands. We do not furnish it with back feed and post brackets, as it has been our experience that small band-saws are carried through the sharpener more accurately on pulleys and stands than with post brackets.

Tight and loose pulleys on countershaft, 5 1/2-inches diameter, 1 1/2-inch belt.

Speed about 650 revolutions per minute.

Emery wheel 8-inches, diameter, 5/8-inch hole.

Thickness about 1/2 distance from point to point of saw teeth.

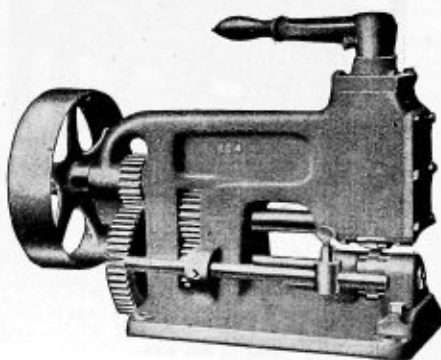
PRICE:—Machine only.....\$75.00

Weight, 300 pounds.

Machine, with pulley and stands, without benches.....\$85.00

Weight, 450 pounds.

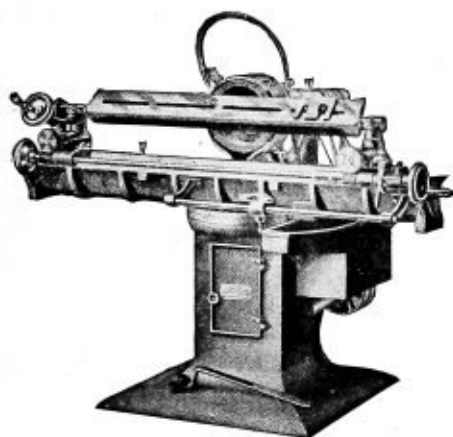
Emery wheel and belt, \$3.00 extra. State whether Right or Left Hand machine is wanted, cut shows Left Hand.

**No. 104 STRETCHER FOR BAND RESAWS**

Designed for stretching band resaws and gang saws. The upper and lower rolls are geared together to insure even tension on both sides of the saw. Cut gears are used. Rolls are of high grade tool steel, hardened and ground to exact size,

For Saws	Weight	Price
6 inches or less.....	175 lbs.	\$65.00
8 inches or less.....	190 lbs.	75.00

COVEL AUTO CUP WHEEL KNIFE GRINDER



No. 103—Style D

With Automatic Screw Cross Feed, Water Attachments, Reversible Knife Holder for Front or Back Beveling, and a 2-Slotted Knife Bar

Machines in above style except with a 2-slot knife bar and adjustable post supports for ends of bed on 32 to 48-inch sizes, automatic in all respects, with water attachments, equipped with belting and cup wheel, knife holder as illustrated, with bolts for knives, will be furnished. One wheel and belting furnished with each machine.

Unless otherwise specified, machines will be shipped without water attachments.

The tight and loose pulleys are 4½ inches diameter, 3½-inch belt, and should run from 1,200 to 1,600 revolutions per minute, according to grade of wheel in use. Size of base on floor 26x28. Height to spindle 35 inches. Automatic cross-feed mechanism. Machine will afford flat or concave grind.

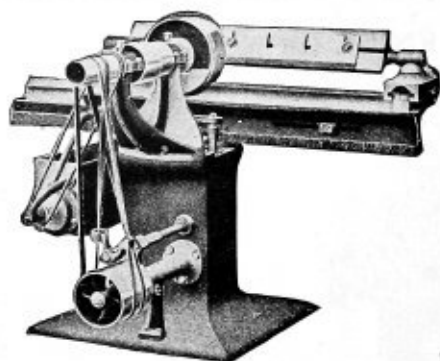
The V-shaped dog which trips the feed pawl may be set to feed from 1-1000 to 8-1000 inch at each round-trip of slide, thus giving operator a wide range in degree of cross-feed.

This machine furnished with Electric Motor. Price on application.

Sizes	With Water Attachment	Without Water Attachment	Weight, Pounds
26 inch Grinder Cup Wheel, 8 inch	\$120.00	\$110.00	800
32 " " " " " "	135.00	125.00	875
38 " " " " " "	150.00	140.00	950
44 " " " " " "	160.00	150.00	1000
48 " " " " " "	170.00	160.00	1050
54 " " " " " 12 inch	225.00	215.00	1500
60 " " " " " "	240.00	230.00	1550
66 " " " " " "	250.00	240.00	1575
76 " " " " " "	260.00	250.00	1600
84 " " " " " "	275.00	265.00	1700
90 " " " " " "	285.00	275.00	1800
96 " " " " " "	295.00	285.00	1900
108 " " " " " "	310.00	300.00	2000
125 " " " " " "	370.00	360.00	3800
130 " " " " " "	400.00	390.00	4000
156 " " " " " "	500.00	490.00	4750

New Wheels, 8 inch..... \$4.00

New Wheels, 12 inch..... \$7.00



No. 87 COVEL AUTOMATIC CUP WHEEL KNIFE GRINDER

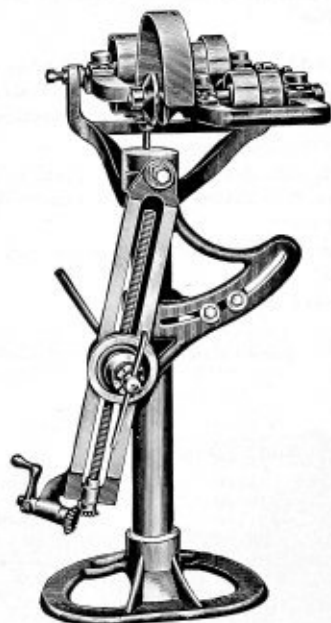
Adapted to either flat or concave grinding. By slacking one bolt the slide can be set at different angles before the wheel. If set at right angle to emery wheel spindle, the knife will traverse back and forth against the flat face, and the knife will be ground to a flat bevel. If it is set any other angle, the edge of wheel will do the grinding and a concave grind result. These adjustments will be appreciated by any one preferring a flat, stout edge for rough work and a thin, concave for fine work. After the machine is started it requires little or no attention. The cup wheel is $8 \times 3\frac{1}{2}$ inches, and is provided with guard. The tight and loose pulleys are $4\frac{1}{2}$ inches in diameter, $3\frac{1}{2}$ -inch belt, and should be run about 1,500 revolutions per minute.

Size, inches	26	32	38	44	48
With Water Attachment	\$100.00	110.00	120.00	130.00	140.00
Without " "	\$ 90.00	100.00	110.00	120.00	130.00
Weight, lbs.....	700	800	900	950	1000

One Wheel and Belting furnished—New Wheels \$4.00 each.

No. 46 HAND SHARPENERS AND GUMMERS

For Circular, Rip and Cross Cut Saws



It will sharpen all styles of saw teeth and has an adjustable stop to regulate the depth of the teeth, thereby insuring a perfectly round saw.

Large size, for saws 12 in. to 72 in.....	\$45.00
Small " " " 8 in. to 40 in.....	30.00
Emery Wheel and Belt, extra.....	3.00

BRAZING FORGE

Hand or Power



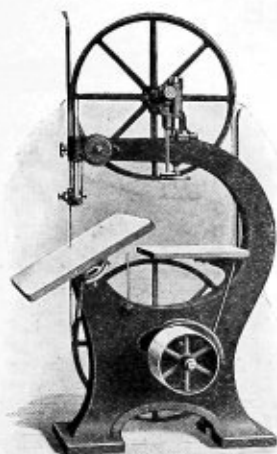
Completely enclosed with a cast iron hood. Front part of the hood is hinged and can be raised to build the fire, etc. This hood is also corked tight with asbestos, which makes it the safest forge manufactured. It is so constructed that the heat is confined and not thrown out as in ordinary tin hood forges which are offered in competition to it. The fire box has special tuyere irons of extreme length and will heat the brazing irons the entire length to a uniform color.

Price, f.o.b. cars factory:

14 inch fire box	\$40.00
20 inch fire box	50.00

This machine can be furnished with tight and loose pulleys for power or with hand lever and ratchet, as shown in cut. If furnished for both hand and power we charge \$5.00 extra.

CRESCENT BAND SAWS



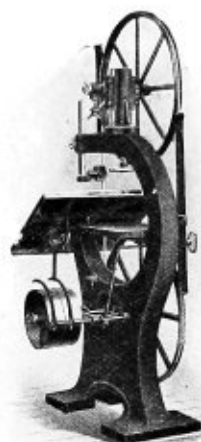
36-Inch Band Saw

45° Angle Tilting Tables; Patented Upper Wheel Bearings; Wright's Anti-Friction Saw Guides; Split Babbitted Bearings with Liners Adjustable for Wear.

Quick Acting, Locking Device and Angle Scale.

The 36-inch machine is the standard size used in planing mills, factories and pattern shops.

The 32-inch is for factory or general planing mill use, and the 26 and 20-inch for smaller work.



32-Inch Band Saw

The Main Frames are cast in one piece and cored out, rectangular section With the Patented Upper Bearing furnished; the upper wheel can be inclined backward or forward, or raised and lowered while the saw is in motion. A spring near the back end of upper shaft holds bearing in proper position, preventing back-lash to the upper wheel should the saw break. The tension spring is telescoped over the raising screw, and is located inside the frame.

The Belt-Shifter is arranged with handle under the sub-table, and is within easy reach of the operator from the front of the machine.

The Lower Shaft runs in a long bearing bolted rigidly to the frame of machine.

The loose Pulley Shaft is bored hollow forming an oil chamber.

Guides—Wright's Anti-Friction Saw guides are furnished—No. 0 size for 26-inch, and No. 1 size on larger machines. A simple plain guide is supplied for below the table, but when so ordered the No. 0 Wright's guide may be had at \$6.00 Extra.

Tilting Tables are provided, also graduated brass scale and pointer indicating degrees of angle. Table will tilt to any angle up to 45° and is rigidly held in position by eccentric lever. Stop is provided for setting table square.

Wheels are iron, carefully turned inside and outside of rim and properly balanced.

The 20-inch Machine has stationary upper shaft, wooden table, and is without the spring-tension and angle scale.

Extras—Ripping Gauge, \$10.00; Segment Gauge, \$50.00; Re-Saw Gauge, \$30.00.

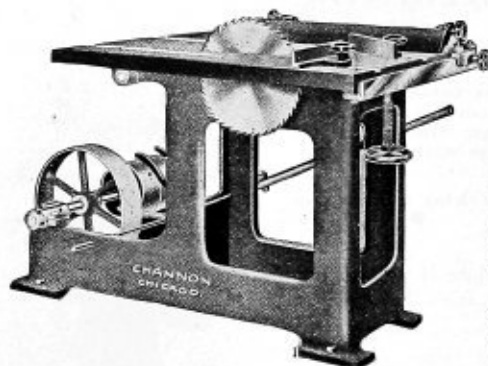
Rubber Tires—For wheels.....36-inch 32-inch 26-inch 20-inch
Price each.....\$2.75 \$2.20 \$1.40 \$1.00

SIZES AND SPECIFICATIONS

Size	36-inch	32-inch	26-inch	20-inch
Size of band wheels.....inches	36 x 2	32 x 1 3/4	26 x 1 1/2	20 x 1 1/4
Distance clear from saw to frame....."	36	32	26	20
Height clear under guide, when raised....."	17	13	9	7
Size of table (iron)....."	28 x 32	24 x 28	20 x 24	20 x 24 (wood)
Size of tight and loose pulleys....."	12 x 4	12 x 3 1/2	10 x 3	7 x 3
Speed, rev. per minute....."	400 to 450	400 to 450	400 to 450	400 to 450
Length of saw blade....."	18 ft. 6 in.	16 ft. 4 in.	13 ft. 9 in.	10 ft. 1 in.
Width of saw blade reg. furnished....."	3 1/2	3 1/2	3 1/2	3 1/2
Floor space required, over all....."	39 x 57	35 x 48	30 x 40	20 x 30
Shipping weight.....lbs.	1200	900	625	290
Horse power required....."	2 to 3	1 to 2	1 to 1 1/2	1/2 to 1
Price, with iron band wheels.....	\$130.00	\$105.00	\$80.00	\$40.00

Equipment—Each machine is furnished with one anti-friction roller saw guide above table, one plain guide below table, one pair brazing tongs, one brazing clamp, and one saw blade of width specified in above table.

No. 5 COMBINATION SAW TABLE



The Machine is adapted for use as a rip, cross-cut, grooving or dado machine and is a fine tool for furniture factories, planing mills, pattern makers and anyone needing a good working saw. Tight and loose pulleys on countershaft are 8 inches in diameter and 4-inch face. The driving pulley is 16 inches in diameter and 4-inch face. Weight 700 pounds. Countershaft speed 550 revolutions per minute. We do not furnish saw with machine.....Price, \$85.00

No. 6 SELF-FEED RIP-SAW TABLE



Table is all iron, heavily ribbed, 37 inches wide by 5 feet 8 inches long.

The entire feed works adjust automatically to the varying thicknesses of stock being cut by operator. The feed can be stopped or started, the feed works raised or lowered by operator without leaving his position.

This machine will take an 18 or 20 inch saw and rip 3 or 4 inches regularly, or, if required, even 6 inches thick, also 16 or 17 inches wide. Saw arbor collars can be supplied up to a set 3 or 4 inches long. The saw arbor is $1\frac{3}{4}$ inches in bearings and $1\frac{1}{4}$ inches where the saws are placed. Pulley on saw arbor is 8 inches diam. by $7\frac{1}{2}$ -inch face. The feed works consist of three changes of feed, from 85 to 200 feet per minute. Saw arbor speed, 3,100 revolutions for 14-inch saw, or 2,800 revolutions for 18-inch saw. We do not furnish any saw with the machine, neither do we furnish any countershaft, but when ordered can furnish them at extra cost. The driving pulley on countershaft is 24 inches in diameter and 7-inch face. The tight and loose pulleys are 10x8 inches.

Weight with countershaft 2,200 pounds.

Price without countershaft.....\$250.00
Price with countershaft.....275.00



**Has Adjustable
Counter
Balance**

No. 7 SWING CUT-OFF SAW

The guard, provided, will take saws up to 24-inch diameter.

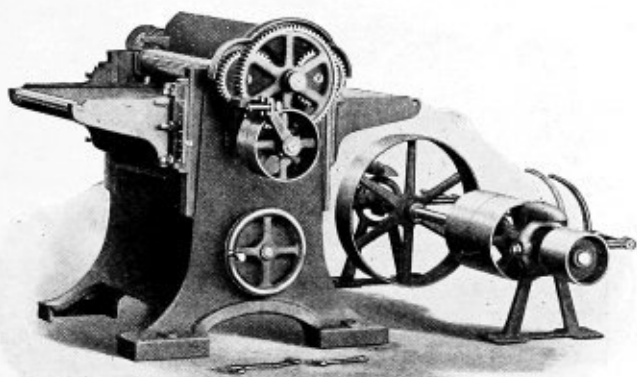
Arbor is turned to $1\frac{1}{4}$ where saw goes on and $1\frac{1}{8}$ in bearings.

Length of arm 6 feet, tight and loose pulleys, 8 inches by 5 inches. Drive pulley, 16 inches by 5 inches. Arbor pulley, $5\frac{1}{2}$ inches by 5 inches. Revolutions of countershaft, 450. Weight 400 pounds. Price.....42.50

Price does not include saw.

Fig. 484 PLANERS

18 and 24-inch



The Frame of this machine is cast in one piece, insuring a steady-running machine, impossible to get racked out of alignment; this feature being above comparison with bolted frames.

The Bed is gibbed direct to the body of the frame—does not slide on ways inside of frame. This construction is rigid, accessible for adjustment, and not liable to clip the ends of the lumber.

The Chip-Breaker and Pressure-Bar are placed as close to the head as clearance will allow, so that extremely short stock may be worked.

The Bearings for the head are entirely free from complication. The lower part is cast solid with the frame, insuring permanent alignment. They

are filled with the best grade of high-speed babbitt. They are provided with self-closing oil-covers, to exclude dust; and also with an oil-chamber and capillary felt, making them practically self-oiling. The other bearings throughout the machine have self-closing oil-covers where possible.

The Head is milled from solid bar of steel, of proper grade of carbon. It is carefully balanced; is suited for two knives; and is driven by flanged pulley, securely keyed on.

The Feed is driven from countershaft to a pair of tight and loose pulleys on the machine. For starting and stopping the feed, a convenient belt-shifter is provided. Regularly the machine has a feed of 25 feet per minute, but will be furnished at same price with larger pulley to give a feed of 30 feet per minute. Upper rolls only are driven, the infedding roll being corrugated. All the rolls are made of steel. Gears are cast from cut patterns, faced off on side.

A Scale made of brass, neatly graduated, shows accurately the thickness of stock being surfaced. One revolution of hand-wheel will raise table $\frac{1}{8}$ inch.

Countershaft. The machine may be belted in any direction to countershaft—above or below, to front or rear. Countershaft has drip-cups, shifter-fingers, and connection for lever.

Dimensions	18-inch Planer	24-inch Planer	Dimensions	18-inch Planer	24-inch Planer
Width and thickness will plane	17 $\frac{3}{4}$ x6 in.	23 $\frac{3}{4}$ x6 in.	Floor space, exclusive of countershaft	45x44 in.	45x50 in.
Width of drive-belt	4 in.	4 in.	Shipping weight	1,200 lbs.	1,400 lbs.
Size of tight and loose pulleys	10x5 in.	10x5 in.	H. P. Required	3 to 5	4 to 5
Speed of countershaft, per minute	825 rev.	825 rev.	Price	\$170.00	\$200.00
Width of feed-belt	2 in.	2 in.			

Equipment. Each machine is furnished with countershaft, pair of (two) knives and two wrenches.

Fig. 486 PLANER AND MATCHER

24-inch

This machine is constructed on the same general lines and same dimensions as the 24-inch Fig. 484 Planer described above. The matcher heads are suited for matching, or edging up lumber either square or molded edges. The matcher heads and gauges can readily be removed, leaving the machine clear and ready as a surfacer. The countershaft is placed to rear of machine, and we recommend it should not be less than 96 inches from the center of planer head. The countershaft can be belted in any direction to the line shaft, and is provided with convenient shifter.

DIMENSIONS AND PRICE

Width and thickness will match	12x2 in.
Width and thickness will plane	23 $\frac{3}{4}$ x6 in.
Floor-space, exclusive of countershaft	50x50 in.
Cubic measure, boxed for export	50 ft.
Gross weight, boxed for export	2,000 lbs.
Domestic shipping weight	1,800 lbs.
Horse Power required	4 to 6
Price	\$350.00
All other dimensions same as 24-inch Planer, Fig. 484.	

Equipment. Each machine is furnished with countershaft, pair of (two) knives for surfacing, pair of matcher heads with knives for matching $\frac{7}{8}$ -inch lumber, and two wrenches. No belts furnished.

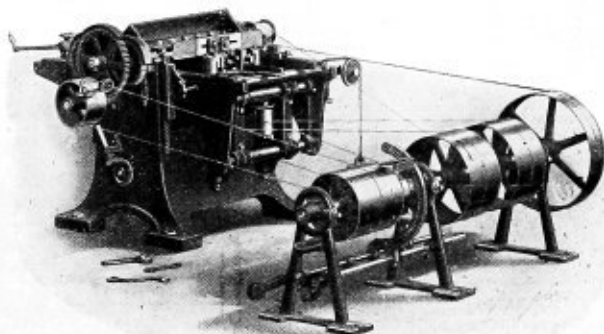
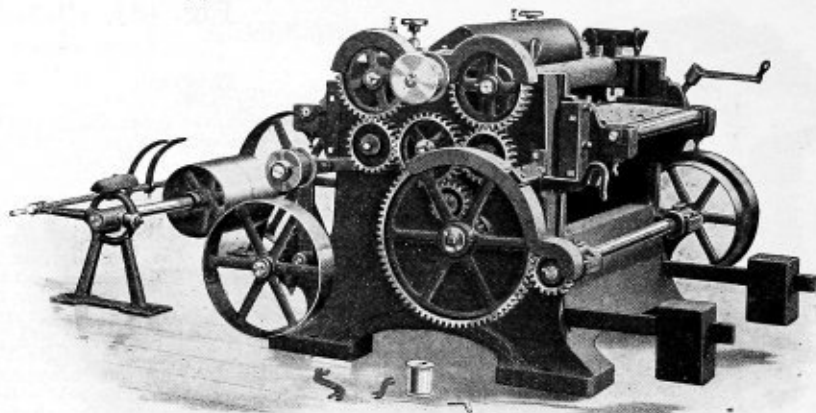


Fig. 488—26 X 8-INCH SURFACER



Frame is cast in one piece, very heavy, insuring a steady, quiet-running machine, and impossible to get racked out of alignment; this feature being above comparison with bolted frames.

Bed is gibbed direct to body of frame and does not slide on ways inside of frame, making it rigid, accessible for adjustment, and not liable to clip ends of lumber. Scale and pointer show thickness of lumber being surfaced.

Chip-Breaker and Pressure-Bar are placed as close to the head as clearance will allow, so short stock may be worked.

Bearings for head are entirely free from complication. Lower part is cast solid with frame, insuring permanent alignment, and are filled with best grade high-speed babbit. They are provided with liners, to adjust for wear; with self-closing oil-covers, to exclude dust; also oil-chamber and capillary felt, making them practically self-oiling. Other bearings throughout the machine have self-closing oil-covers where possible.

Four Feeds are Provided, respectively, 20, 30, 40, and 60 feet per minute, adapting the machine for anything from finest cabinet-work to plain rapid surfacing. The feed is driven direct by belt from head, which always maintains proper feed proportion, regardless of any slippage in drive-belt. Upper rolls only are driven, the infeeding roll being corrugated.

Head is milled from solid steel, of proper grade of carbon, carefully balanced; is suited for two knives, and is driven by flanged pulley securely keyed on. A four-sided head will be

furnished when ordered, at an extra charge for two additional knives only.

Countershaft for single-belted machine may be placed under floor, on floor back of machine, or on ceiling. For the double-belted machine it may be on the floor back of machine or on ceiling.

DIMENSIONS

Width and thickness will plane.....	26 x 8 in.
Width of drive-belt, single-belted.....	5 in.
Width of drive-belts, double-belted.....	4 in.
Tight and loose pulleys on countershaft.....	10 x 6 in.
Speed of countershaft per minute.....	1,000 rev.
Width of feed-belts.....	2 1/2 in.
Length of down feed-belt, slow feeds.....	7 ft. 5 in.
Length of down feed-belt, fast feeds.....	7 ft. 8 in.
Length of feed-belt, across.....	9 ft.
Floor-space, exclusive of countershaft.....	61 x 54 in.
Cubic measure, boxed for export.....	61 ft.
Gross weight, boxed for export.....	3,000 lbs.
Domestic shipping weight.....	2,600 lbs.
Price, single-belted.....	\$290.00
Price, double-belted.....	300.00

Equipment. Each machine is furnished with countershaft, pair of (two) knives, and two wrenches. Orders should specify whether single-belted or double-belted type is desired. If not specified, single-belted will be shipped.

Fig. 490

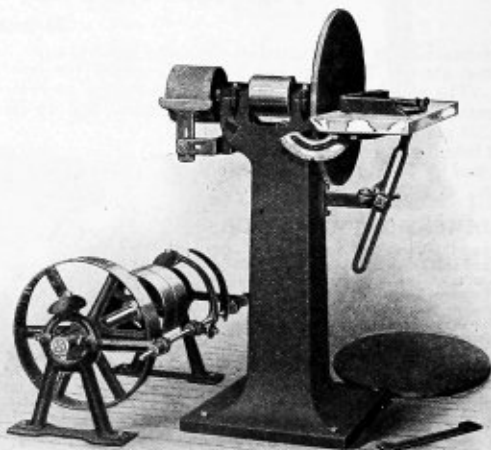
18-INCH DISK GRINDER

A handy and useful machine for any pattern-shop, wood-working shop, or machine-shop. For use on wood, it will do work similar to a wood-trimmer, but will face off larger surfaces, and do it quickly and accurately. In a metal-working shop it will do a large part of the fine-work at a saving of time and files. By using an emery wheel on back end in place of drum it makes a handy grinder. Machine will take emery wheel 10 inches diameter, 1-inch face, 1-inch hole. The table is adjustable for any angle from 45 degrees downward to 45 degrees upward, a graduated scale indicating the angle.

DIMENSIONS

Diameter of disk.....	18 in.
Size of table.....	10 x 24 in.
Diameter and face of drum.....	6 x 5 in.
Width of belt for mandrel.....	2 in.
Size of tight and loose pulleys.....	8 x 3 in.
Speed of countershaft per minute.....	400 rev.
Floor-space required, over all.....	24 x 27 in.
Shipping weight.....	475 lbs.
Horse power required.....	1 to 1 1/2
Price.....	\$90.00

Equipment. Each machine is equipped with two disks, one drum, one segment-stop, one angle-gauge, and one countershaft.



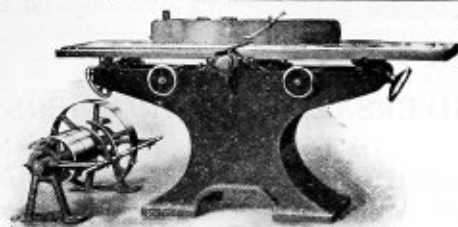


Fig. 482 JOINTERS

A Jointer is sometimes also called a hand-planer, or a buzz-planer. The machine is used for straightening lumber. It will plane one surface straight and out-of-wind; by use of the fence it will also bring one surface, on dimension stock, square with another, or on accurate level with another. It is not intended for surfacing boards to uniform thickness. For such use a regular planer or surfacer must be used. By use of special cutters a Jointer is often used for beading, grooving, making light molding, and other similar work.

Size of Jointer

	8-inch	12-inch	18-inch	24-inch
Length of Knives.....inches	8	12	18	24
Length of Front Table....."	33	42	42	42
Length of Rear Table....."	30	36	36	36
Width of Tables....."	13	17	23	29
Size of Flanged Pulley on Head....."	3½x2¾	4x4½	4x4½	4x4½
Size of Tight and Loose Pulleys....."	8x3	10x5	10x5	10x5
Speed of Countershaft.....R. P. M.	900	800	800	800
Giving Head a Speed of....."	4000	4000	4000	4000
Floor Space, exclusive of Countershaft.....inches	21x64	31x80	37x80	43x80
Horse Power Required....."	2 to 3	3 to 4	3 to 5	4 to 5
Shipping Weight.....lbs.	800	1275	1500	1700
Price.....each	\$ 130.00	\$ 150.00	\$170.00	\$190.00

Equipment. Each machine is furnished with one pair of (two) knives, one countershaft, one fence, one pressure spring, and one wrench.

Extras—Boring attachment \$35.00. **Jointer Knives**—Per inch of length, \$0.15.

Fig. 240 SINGLE-SPINDLE SHAPER

The frame of this machine is cast in one piece, box pattern, with wide base—the best possible type for stability and steady running.

The Table also is cast in one piece with heavy ribs and wide flanges, and being bolted to the frame on planed-off surfaces insures utmost rigidity and accuracy. The table has a 6-inch opening for spindle, fitted with throat-collars; one collar having 2½-inch hole, another having 3-inch hole.

The Spindle is of steel of proper grade of carbon. The collar is welded on solid; afterwards it is machined accurately to size. The spindle-yoke is gibbed to frame in adjustable dove-tailed ways. It is raised and lowered by hand-wheel and screw, and can be held rigidly at any point by a hand screw. The spindle can be lowered entirely beneath the table when down, and will extend above table 7 inches when up. When made regular the spindle above table is 1 inch in diameter, but this can be furnished larger or smaller as ordered, without additional charge, and with but slight delay to an order.

DIMENSIONS

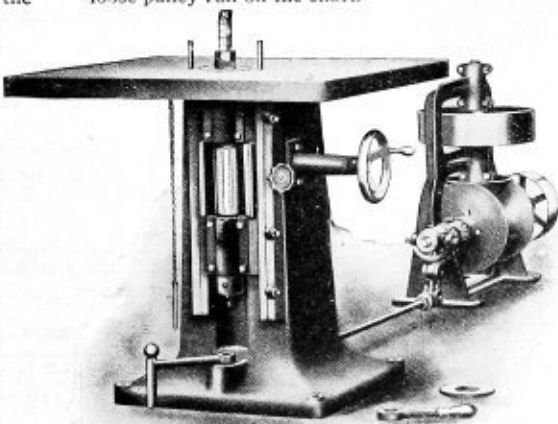
Size of table (iron).....	36x36 in.
Height of table from floor.....	34 in.
Size of pulley on countershaft.....	10x5 in.
Speed of pulley on countershaft.....	800 rev.
Belt required of spindle (3 in. wide).....	14 ft. 8 in. long
Diameter of spindle above table.....	1 in.
Diameter of spindle bearings.....	1½ in.
Spindle projects above table, when up.....	7 in.
Floor-space required, over all.....	36x108 in.
Cubic measure, boxed for export.....	28 ft.
Gross weight, boxed for export.....	1,200 lbs.
Domestic shipping weight.....	1,000 lbs.
Horse Power Required.....	2 to 3 H. P.
Price.....	\$170.00

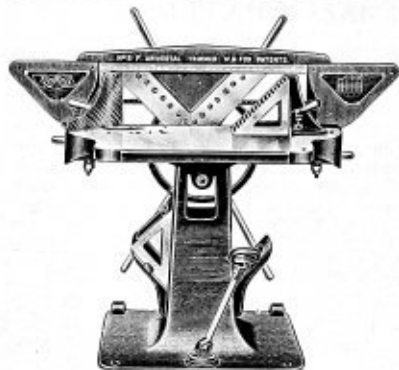
Equipment. Each machine is furnished with one reverse-motion countershaft, one pair of 2-inch plain knives, one guide-pin, collars to fit the spindle, two throat-collars, one wrench, and one pin, with chain, to hold spindle.

Shaper Fence is Extra.....Price, \$10.00

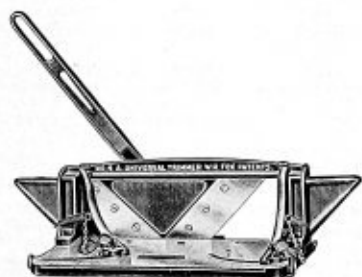
The Spindle Bearings are filled with the best grade of high-speed babbitt; are provided with liners to adjust for wear; have capillary felts for continuous oiling. The end-thrust bearing is made with a fiber step.

The Countershaft stands edgewise to the pull of the belt, which is the proper way—stands solidly. The friction-cones for reversing the motion are pressed from the best friction material obtainable. The reversing-clutch being on outside of frame is accessible, and will not waste oil onto friction-cones, as would be the case if placed under the cones. Loose pulley is not furnished on this countershaft, as it is preferable to let the horizontal shaft run when machine is not in use, rather than to leave a loose pulley run on the shaft.

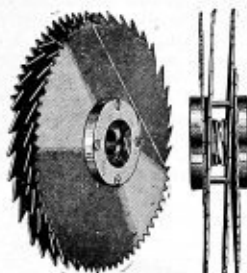




No. 8 F Fox Universal Trimmer



No. 4 A Fox Universal Trimmer

No. 1 Adjustable Head
For General UseNo. 4 Adjustable Head
For Narrow
Work

FOX UNIVERSAL WOOD TRIMMERS

The Style A machines cover a limited range of angles and are of small capacity but are well suited for use in supplementing the large, full universal machines.

The Style E machines, not illustrated, are an intermediate size, standing on tripod base. They are machines of medium capacity at a moderate price.

Size No. of Machine	Height of Cut inches	Length of Cut inches	Size of Bed in inches	Between Gauges, inches	Length of Stroke inches	Ship Weight	Price Each	Extra Knives Per Fr.
No. 4 A	4	8	7½x17½	14	9	45	\$ 28.25	\$ 7.50
No. 5 A	4¾	8	9½x20	16½	8½	65	31.25	8.75
No. 6 A	6	12½	11½x27½	22	13½	155	56.25	11.25
No. 5 G	5	9	10x28½	18½	9½	145	75.00	9.50
No. 4 E	4	9½	13x29½	17½	9½	230	81.25	9.50
No. 6 E	6	12½	18x39½	24½	13½	480	112.50	11.25
No. 6 F	6	19	18x35	19	27	555	162.50	12.50
No. 8 F	8	24½	24x40	24½	32	825	187.50	15.00

FOX SAW DADO OR GROOVING HEADS

This device for gaining or grooving work is perfectly adjustable and when expanded will cut twice the closed width; that is, a head cutting ¾ inch will cut any width between that and 1½ inches. The heads are composed entirely of saws. They have more spur cutting surface and more inside cutting points, consequently more cutting ability and will cut faster and smoother and last longer than others.

NO. 1 ADJUSTABLE HEAD

Range of Cut	¾ to ¾	½ to 1	¾ to 1¼	¾ to 1½	¾ to 1¾	1 to 2	1¼ to 2½	1½ to 3	2 to 4
Diameter 8-inch	\$24.00	\$23.00	\$23.00	\$23.00	\$24.00	\$24.00	\$25.00		
" 10-inch		26.00	25.00	25.00	25.00	26.00	26.00	\$28.00	
" 12-inch			30.00	28.00	28.00	28.00	29.00	30.00	\$32.00
" 14-inch				34.00	32.00	32.00	32.00	34.00	38.00
" 16-inch					38.00	38.00	38.00	38.00	40.00
Arbor length required,	1½	1½	2	2½	2½	3½	3½	4½	6½

No. 4 ADJUSTABLE HEAD

Range of Cut	5-32 to 5-16	3-16 to ¾	¾ to ½	5-16 to ¾	¾ to ¾
Diameter 8-inch		\$18.00	\$19.00		
" 10-inch		20.00	20.00	\$21.00	
" 12-inch			22.00	22.00	\$23.00
Arbor length required,	1½	1½	1½	1½	1½



**No. 3
Fox Foot Power Miter**

FOX MITERING MACHINES

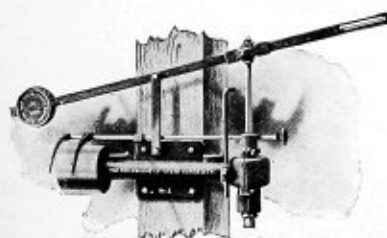
The accompanying is an illustration of the No. 3 Foot Power Machine furnished extensively among the builders of interior finish mills, veneered door, screen, show case, casket, refrigerator and fixture manufacturers. These machines are especially designed for mitering mouldings, and cut a double miter in small mouldings in one stroke, besides producing accurate and smooth work. The No. 3 machine handles mouldings up to three inches wide and may be furnished with reverse head, as well as casket moulding attachment, and squaring gauges when desired.

The No. 5 machine is the same as No. 3, except in size.

We can also furnish the No. 3, No. 4 and No. 5 machines with adjustable steel bed plates recessed into the surface of the bed and adjustable so that they may be set to give a slight "under-cut," if desired.

Size and Style of Machine	Miter Wide	Stroke Vertical	Size of Bed	Shipping Weight	Price Each	Extra Knives Per Pair
No. 2 Hand Power	2	3½	6 x 9	30	\$ 31.25	\$ 6.25
No. 3 Foot Power	3	4½	9 x 12	175	50.00	8.75
No. 5 Foot Power	5	7	15 x 29	330	81.25	13.75
No. 3 Belt Power	3	4½	9 x 12	410	125.00	8.75
No. 4 Belt Power	4	8	18 x 24	650	250.00	12.50
No. 5 Belt Power	5	8	15 x 29	650	250.00	13.75

FOX NO. 1 POST BORING MACHINE (for Wood)



The machine may be very quickly secured to any convenient post or bracket by means of four coach screws. It is provided with T. and L. Pulleys and belt shifter, so that it may be belted direct to the line shaft without a separate countershaft.

It has an adjustable depth stop for boring holes of certain depths.

The machine is regularly provided with hand feed lever as above, but may be supplied with a foot treadle, treadle rod and connection for an extra charge, as below.

The spindle is regularly furnished with a ½-inch hole and set screw to take bits with ½-inch straight shanks, and may be fitted with a chuck for holding drills and bits of different size shanks if desired.

Center of spindle to front of post plate 7 in.
 Throw of spindle.....10½ in.
 Net weight regular machine.....110 lbs.
 Shipping weight boxed.....150 lbs.
 Size of box.....14x11x39 in.
 T. & L. pulleys.....7x3 in.

Speed.....600 rev.
 No. 1 Post Boring Machine, regular, \$31.25
 Extra for foot treadle, treadle rod and connection.....3.25
 Extra for chuck opening 0 to ¾ in., fitted.....8.75

"GREAT WESTERN" RAILROAD OR GRADING PLOWS**12-Horse Plow No. 103**

Plows furnished either right or left hand. All have best reversible steel cutters.

The Standard, Mold-Board and Point are made of extra quality of wrought steel. The mould-board and point are made of the best plow steel, and both double shinned. The handles and beam are of the best second-growth hard wood lumber, with handholds solid steel. Plows Nos. 101 and 103 are also provided with a heavy improved steel shoe or runner upon the side to protect the handles when the plow is dragging. The principal strain is carried by heavy steel draft rod underneath the beam, and the entire plow is constructed to stand the very hardest usage.

Number	Horse Power	Weight, Lbs.	Cuts, Inches	Price	Specify Whether Right or Left Hand	LANDSIDE POINTS	
						Weight, Lbs.	Price
106	2 to 4	150	10	\$29.00		20	\$4.50
105	4 to 6	175	10	32.50		20	5.00
101	6 to 8	230	12	38.00		35	6.00
103	12 to 14	280	12	52.00		50	7.50

The above Plows are furnished with one extra Landside Point.

CONTRACTORS' OR TOWNSHIP PLOWS**Cut of No. 5 or 15**

No. 5 (Left Hand) or 15 (Right Hand). Will run perfectly steady in all kinds of ground, and is very light draft for two horses, but is frequently used with four. Cuts a furrow 10 in. wide and from 6 to 12 in. deep, as desired. Beam of white oak, length 6 ft. and 3x5½ in. at standard. Iron handhold and handles ironed. Wrought iron clevis, with two heavy rings, as shown in cut, and patent reversible cutter.

No. 5 or 15 Plows, weight 145 lbs. Price Each.....\$22.00

No. 3 (Left Hand) or 13 (Right Hand). This plow is of great strength and remarkable lightness of draft. Beam of white oak, length 7 ft. and 3¼x7 in. at standard. Handles braced and ironed with iron handhold. This plow is made to cut a deep rather than a wide furrow. The extra long handles give the holder perfect control. Owing to the peculiar shape of the mold-board (patented) these plows can be drawn easily by two horses, but are strong enough for six or eight. It has an adjustable gauge wheel 3x6½ inches.

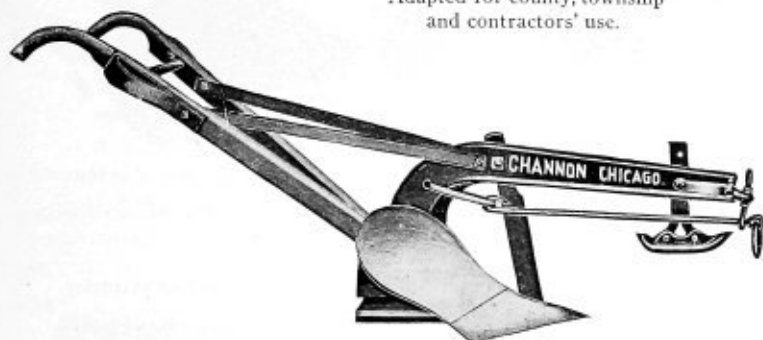
No. 3 or 13 Plows, weight 205 lbs. Price Each.....\$27.50

Extra Landside Points, \$2.50 charged extra on Nos. 3 or 13, 5 or 15 Plows.

No. 10 PRINCESS ROAD PLOWS

With Cast Iron Beam

Adapted for county, township
and contractors' use.



Our Princess Plows have cast iron beams, and are constructed for heaviest railroad and street grading. They are adapted for two, four and six horses, and are very strong, compact and durable.

Handles are protected with strap iron and handle loops.

Can be furnished with wheel with chilled face instead of regular shoe.

No. 10 "A" all steel, cut 12 inches, weight 170 pounds, with wood handles.....Price, \$30.00 each
No. 10 "D" all chilled, cut 12 inches, weight 170 pounds, with wood handles....." 20.00 "
With all steel handles add \$2.00 net

PRINCESS ROOTER OR HARD PAN PLOW

For 10 or More Horses or Traction Engine. An Indispensable Tool
With All Contractors. Self-Sharpening



This is a high grade implement. It will do perfect work if properly handled in macadam, shale, cobblestone or any kind of street improvement work and for sewer or pipe line trenches, weight 305 pounds. Price each \$45.00

No. 99 GIANT WOOD BEAM PLOW



Is adapted for four or more horses and built for roughest use. Beam in addition to being extra heavy is braced with $\frac{1}{4} \times 3$ steel strap on bottom, forming draft rod which connects to standard which is heavy wrought steel. Has bar share, mould board, landside and share handles are of steel, well braced. Made right hand only, weight 230 pounds.....Price \$45.00

"COLUMBUS" DRAG SCRAPERS



Plain Scraper



With Runners



With Bottom Plate

Bowl is without seam or lap, full size, full weight, steel bail and steel swivel.

Note the position of the handles, i. e., on top and strongly riveted; the bail, and the way it is fastened to bowl on side.

It is without joint or seam, and there is not a sharp corner, angle, bolt, brace, or stay-rod about the scraper.

It will work in any kind of soil, whether plowed or not.

	Price
No. 1. Carries 7 feet of earth. Used for long haul or down grade. Size of bowl: Top of back to cutting edge, 34 inches; width, 33 inches; depth, 10 inches; weight, 102 pounds; each.....	\$7.00
No. 2. Carries 5 feet of earth. For all ordinary grading, farm, road or township work. Size of bowl: Top of back to cutting edge, 31½ inches; width, 29½ inches; depth, 9½ inches, weight, 89 pounds; each.....	6.50
With steel runners, add to above prices.....	.50
With double bottom plate, 13x21 inches, add to above prices.....	.75
For runners or bottom plates add 8 pounds extra per scraper.	

No. 3 OR "DITCHING" SCRAPER

Made with extra long nose, and the cutting edge is well sharpened, so that it enters the ground as readily as a plow.

Capacity, 3 cubic feet. Intended for work on narrow ditch with one horse. Size of bowl: Top of back to nose, 32 inches; width, 26 inches; depth, 9½ inches; weight, 82 pounds.

Price, with runners..... \$6.50

THE "BOSS" DRAG SCRAPERS



Bowls pressed from a single sheet of specially hardened steel, without joint, seam or rivet. Handle sockets on side of bowl.

- No. 1. Capacity, 7 cubic feet; weight, 94 pounds, with runners.....each \$7.00
- No. 2. Capacity, 5 cubic feet; weight, 80 pounds, with runners.....each 6.75

VICTOR DOUBLE BOTTOM DRAG SCRAPERS

Solid steel Bowl with square back; Bowl is heavy and full size, swivel is steel and very strong. Secured to bail by four steel rivets, made with double rivets.

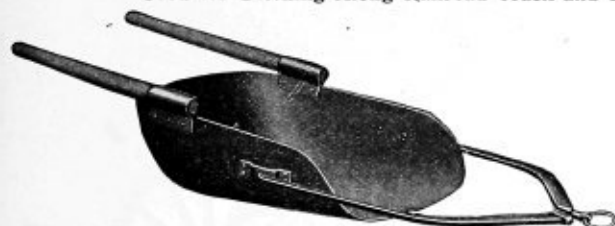
No. 1. Capacity, 7 cubic feet, weight, 110 pounds.....Price each \$7.75

No. 2. Capacity, 5 cubic feet, weight, 100 pounds.....Price each 7.00



PRESSED STEEL OX SHOVELS

Used for Ditching Along Railroad Track and Drawn by Locomotive Usually

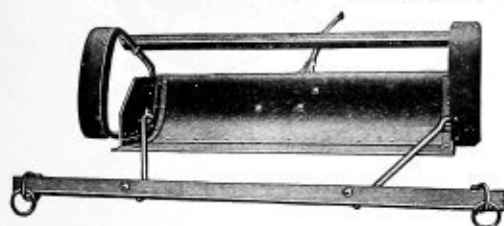


Furnished with heavy iron Bail as shown or with 1/2-inch Chain Bail.

Wooden handles are 3x48 inches.

PRICE WITH RUNNERS

Size No.	Capacity Cubic feet, about	SIZE OF BOWL			Weight, pounds	Price Each
		Top of Back to Cutting Edge	Width, inches	Depth, inches		
0	10	36	35	11 1/2	133	\$20.00
00	13	38 1/2	37	13 1/2	178	27.50
000	17	46	42	16	210	31.50

IMPROVED BUCK SCRAPERS

This scraper is designed for use in leveling lands, building canals, railroads, and for construction work on which drag scrapers can be used.

No.	Capacity, cubic feet	Cutting edge, width	Bowls, gauge	Ends	Cutting edge width, thickness	Weight lbs.	Price Each
3	12	3 feet	No. 10	1/4 in.	13 1/2 x 3/8	255	\$25.00
2	14	4 "	" 10	1/4 "	" "	270	26.00
1	18	5 "	" 10	1/4 "	" "	325	28.00

With two large or four ordinary horses one man can move 150 cubic yards and more in 10 hours. The same kind of work can be done with the "Buck" as with the ordinary drag scraper, and when desired the load can be distributed in layers 1 to 12 inches deep, leaving the soil on top of the embankment in perfect condition.

No. 1 TONGUE SCRAPER AND DITCHER

No. 1. 48 inches wide, weight 133 pounds.....\$14.00

With steel bottoms, with ground edges and steel shoes. No whiffle-trees or neck-yokes furnished with scrapers. Designed for making and leveling roads, cutting and cleaning, irrigation and other large ditches, and it is well adapted for moving earth short distances.

The steel blade is 48 inches long by 4 inches wide by 1/4 inch thick.

There is an extra iron plate under the wood bottom 1/8 inch thick.

No. 42 FLAT BOARD SCRAPERS**For Making Ditches and Embankments**

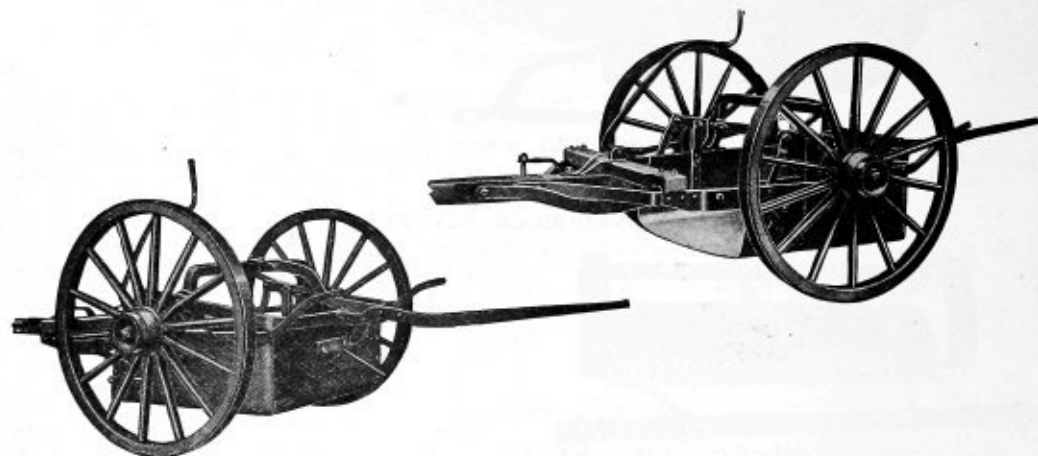
Because of the peculiar shape and attachment of the curved draw bars, this scraper can be handled with ease. We put on bent cultivator handles when especially ordered. 48 inches wide, weight 75 lbsEach, \$10.00

**No. 47 ROAD LEVELERS**

Are substantially built, 6 feet long and have a hard steel blade 4 x 1/4 in., beveled to a cutting edge. Are used in leveling and smoothing rough roads. Price each.....\$20.00

THE "TWENTIETH CENTURY" WHEELED SCRAPER

SQUARE BOX—WESTERN PATTERN



A Wheeled Scraper which combines perfect working principles with strength and durability

BOWLS: The bowls are formed from a single sheet of metal, being shaped by special machinery and without heating. They are not stretched nor thinned at the edges or corners where they are subjected to the most wear. Bowls are made of high carbon steel and bottoms oil tempered.

FORGINGS: The levers and bars are carefully forged, and the bail is shaped to conform to the top edge of the bowl, thus materially increasing its carrying capacity.

AXLE: The axle is well made of a single bar of steel, forged to the desired shape. Axle is arched high to clear load, and carries the bowl well above the ground.

OPERATION: The No. 2 Wheeler can be filled in good material by one man, but in heavy material it is better to have two. It can, however, be dumped by one man. The No. 3 Wheeler requires two men to fill, but can be dumped by one, if he is an experienced Wheel Scraper man, although two are frequently employed. The No. 2 is generally loaded with one team, but if the material is very heavy, a snatch team is sometimes used. In this case draft rods can be attached to the No. 2 Wheeled Scraper Tongue, or the snatch team can be hitched direct to the end of the tongue. The No. 3 always requires a snatch team for loading.

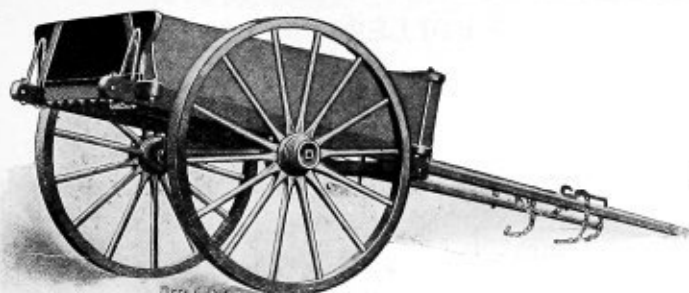
The No. 1 size can be loaded by one man, and two horses can pull it up an incline almost as easily as a drag scraper; this makes the No. 1 as cheap to operate as a drag scraper and it carries a larger load than the largest size of the drags; the load, too, can be carried further, making the unit cost of excavation much lower.

Specifications and Prices

Size Number	Capacity, Cubic Feet about	SIZE OF BOWL OR BOX				Diameter of Wheels, Inches	Gauge of Track, Center to Center of Wheels, Inches	Weight Each, Lbs.	Price Each
		Length on Bottom, Inches	Width at Back, Inches	Depth at Back, Inches	Depth at Front, Inches				
1	10	36	36½	12¼	11¼	38	53	500	\$40.00
2	12	36¾	38¼	13¼	12½	40	56	675	58.00
2½	14	39¾	38¼	13½	12½	44	56	750	65.00
3	16	41½	44	15	14½	46	61½	815	70.00

Automatic front end gate for any of above sizes, \$8.00 extra.

Whiffletrees and Neck yokes—per set, \$7.00 extra.



CONTRACTORS' LIGHT AND HEAVY DUMP CARTS

Light cart. Capacity, 21 cubic feet or 2,500 lbs. Weight, 700 lbs.
Heavy cart. Capacity, 24 cubic feet or 3,500 lbs. Weight, 904 lbs.

Strong, substantial, durable. Made throughout of hardwood, strongly bolted and braced. Specially adapted for the hardest usage, in hauling rock, gravel, clay and other heavy material. Parts easily replaced when worn out.

Heavy cart. Bed, size of inside, 66 inches long, 44 inches wide, 13 inches deep.

Light cart. Same length and width, 12 inches deep.

Wheels. 54 inches diameter.

Hubs. 9 inches diameter, 12 inches long.

Spokes. Fourteen of second-growth hardwood.

Tires. $3 \times \frac{1}{2}$ inch and $3 \times \frac{3}{8}$

Steel Axle. $2 \frac{1}{4}$ inches square.

Spindle. $2 \frac{1}{4} \times 10$ inches and 2×10 .

Wood Axle Bed. $3 \frac{1}{4} \times 8$ inches.

Shafts. Oak or ash, $2 \frac{1}{4} \times 3 \frac{1}{4}$ inches, with heavy crossbar, $2 \frac{1}{2} \times 8$ inches.

Supplied with necessary chains and hooks as in cut.

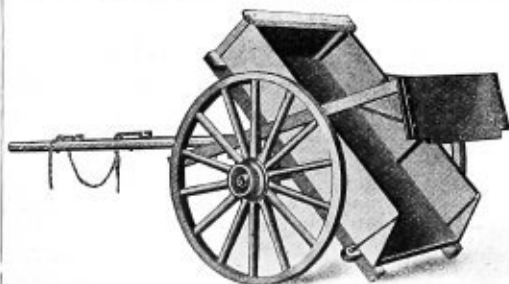
The bed has two sills with cross piece at rear end. The sides, ends and bottom are all $1 \frac{1}{2}$ inches thick. The front end board has cross piece on top, bolted down through the sills, and these bolts firmly bind together the front end of the bed. There are also four anchor bolts inside on each side board, firmly securing them to the side hills, and the side boards have iron straps along the upper edges. The rear ends of sides and the tail gate have iron braces.

The wheels are set to standard width track, 5 feet 2 inches. Carts painted Venetian red.

No. 80.	Light cart	List price, \$60.00
" 85.	Heavy cart	" 66.00
" 90.	Heavy carts with hopper (shown below) ...	" 79.00
" 100.	Heavy carts with patent automatic dumping end gates (shown below)	" 76.00



Cut of heavy Cart with wing boards or hopper.
Weight, 890 lbs.



Cut of Cart with patent automatic dumping end gate attachment. Weight, 975 lbs.

HAND ROLLERS

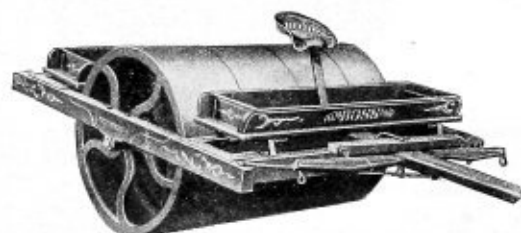
Outer edges beveled. Turned smooth on face and silver finished



No.	Diameter, inches	Length, inches	No. Sections	Face, inches	Weight, pounds	Price Each
1	15	15	2	7½	150	\$ 9.50
2	15	22	3	7½	200	12.50
3	20	16	2	8	225	14.00
4	20	20	2	10	250	15.50
6	20	24	3	8	300	18.50
8	20	30	3	10	350	21.50
9	24	20	2	10	400	24.50
10	24	24	2	12	450	27.50
12	24	30	3	10	500	30.50
14	28	24	3	8	500	30.50

Can furnish these rollers to weigh 50 to 300 pounds more than the weights given, for which add 5 cents per lb.

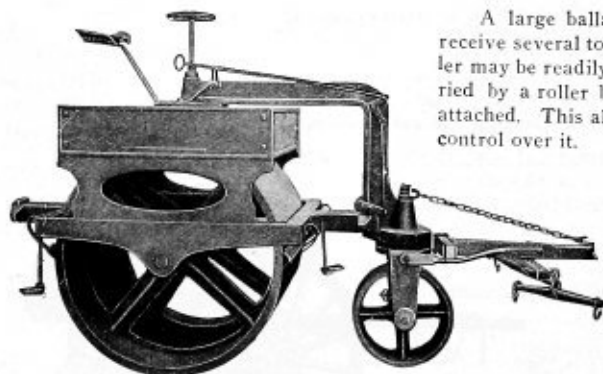
HORSE ROLLERS



No.	Diam., inches	Length, feet	No. Sect'ns	Face, inches	Weight, pounds	Price Each
80	36	4	4	12	3,000	\$188.00
81	36	5	5	12	3,500	214.00
82	36	6	6	12	4,000	240.00
83	48	3¾	3	15	4,000	248.00
84	48	5	4	15	5,000	304.00
85	48	6¼	5	15	6,000	360.00
86	54	3¾	3	15	6,000	368.00
87	54	5	4	15	8,000	484.00
88	54	6¼	5	15	10,000	600.00

Whippletrees and neckyoke, \$6.00 extra.

REVERSIBLE ROAD ROLLERS



A large ballast box is provided which is strong enough to receive several tons of ballast, so that the original weight of roller may be readily increased. The front end of the frame is carried by a roller bearing wheeled truck to which the tongue is attached. This allows the roller to run steadily and gives easy control over it.

The main roll shaft is stationary and the rolls are in two sections, revolving on the shaft and turning independently of each other and so permits easy turning in going around a curve or turning off to one side.

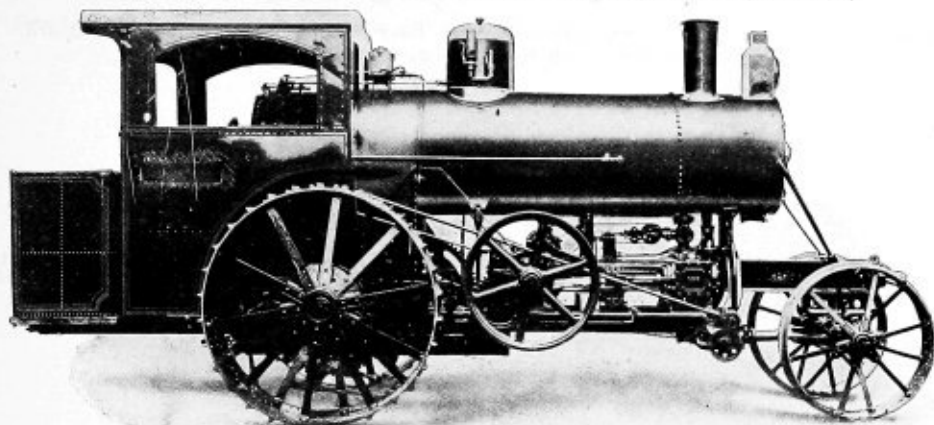
The roller is so constructed that the tongue and front truck permit of being turned at full right angles to main roll.

This reversible feature is of great value, as it saves the time and power required to turn the roller, and avoids the depressions in the roadbed caused in turning. The driver can reverse the roller without dismounting, the latch or locking lever being within easy reach.

The break is effective and operated with a hand wheel convenient to the driver.

No.	Weight, tons	Diameter, inches	Width, inches	Price, per ton
10	4	56	54	\$100.00
20	5	58	54	100.00
30	6	60	54	100.00

"CONTRACTORS' SPECIAL" TRACTION ENGINE



The construction of this engine is such that it possesses many features of peculiar advantage for Tractor Work of all kinds, including Grading, Excavating, Lumber, Dirt and Ore Hauling, etc.

1. The engines and gearing, being mounted on an Independent Steel Frame Work, no Loose Brackets or Leaky Bolts are possible. The boiler is entirely free from the strains which, in the case of ordinary top-mounted engines, seriously impair the life of the boiler.

2. The double cylinders develop enormous power and this power is transmitted through the gearing and pulls on the load in a straight line and not down from the top of the boiler, as with top-mounted engines.

3. This engine is guided by means of a screw shaft guide which is easy to handle.

4. The engine and cylinder parts are low down and the operator can oil them or make any necessary adjustments while standing on the ground.

Equipped regularly with Double Speed Gear, Steel Master Gears and Steel Pinions, Rocker Grates, Oil Pump, Governor, Heater, Injector, Independent Pump, Ejector, Headlight, Seat, Gravity Gear Oilier, Locomotive Cab and Jacketed Boiler.

Specifications and Dimensions

Indicated Brake Horse Power.....	75
Diameter of Boiler.....	36 in.
Number of Tubes.....	66
Diameter of Tubes.....	2 in.
Length of Tubes.....	84 in.
Length of Firebox.....	43.25 in.
Width of Firebox.....	31 in.
Height of Firebox.....	39.5 in.
Grate Surface.....	9.3 sq. ft.
Heating Surface.....	281.95 sq. ft.
Size of Cylinders.....	7x10 in.
Diameter of Crank Shaft.....	3 1/2 in.
Diameter of Rear Axle—4 1/2 in. reinforced to 7 in. by a cast iron mold Face of Gearing—Bull Gears and Bull Pinions 6 in., other gears.....	5 in.
Diameter of Flywheel.....	41.25 in.
Face of Flywheel.....	12 in.
Revolutions per minute.....	240
Steam Pressure per sq. in.....	140 lbs.
Diameter Rear Wheels.....	67 in.
Face of Rear Wheels.....	26 in.
Diameter of Front Wheels.....	46 in.
Face of Front Wheels.....	12 in.
Capacity of Tank underneath Engine.....	139 gal.
Capacity of Coal Bunker on Engine.....	320 lbs.
Water Capacity of Platform Tank.....	224.5 gal.
Coal Capacity of Platform Tank.....	1775 lbs.
Extreme Length of Engine.....	22 ft.
Extreme Width of Engine.....	9 ft. 10 in.
List Price.....	\$4250.00

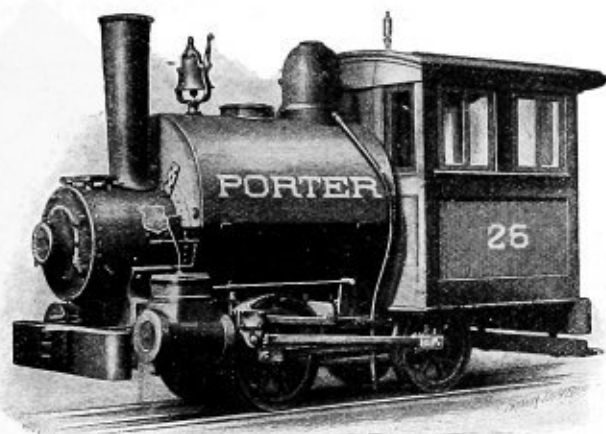
THE "EAGLE" CONTRACTORS' DUMP WAGON

Dumps with the Foot. Winds Up with Hand Lever. Easy Spring Seat. Good Foot Board. Steel Axles Only, with Sand Guards for Rear Wheels



PORTER LIGHT SADDLE TANK LOCOMOTIVES

New Design for Contractors, Logging, Plantations, Inside and Outside Mines, Rolling Mills, or Other Service



Built 30-inch Gauge and Upward

The above design is the most popular and widely used contractors' locomotive built. Kirwan and Kittel are usually kept in stock for immediate delivery for 36 inches gauge. The Kittel is the size most generally used by contractors. These locomotives are built with boilers to insurance companies' requirements, and abundantly free steaming; best forged iron frames; steel crossheads; open hearth steel forgings; best materials and workmanship and of design which is the result of 35 years' experience. All Porter Co.'s locomotives are built to exact system, and duplicate parts which will fit correctly are kept on hand in stock. These locomotives are especially adapted for industrial service, coal and ore roads, quarries, tramways, etc.

Code Word.....	Kirche	Kirmes	Kirwan	Kismet	Kittel	Kittim
Cylinders, { diameter, inches.....	5	6	7	8	9	10
{ stroke, inches.....	10	10	12	14	14	14
Diameter of driving wheels, inches.....	20	20	24	28	28	30
Wheel-base, feet and inches.....	4-0	4-0	4-8	5-0	5-3	4-6
Length over bumpers, feet and inches.....	11-0	11-6	12-9	14-0	15-4	16-9
Extreme height above rail, feet and inches.....	9-4	9-6	9-8	9-10	10-0	10-3
Weight in working order, all on driving wheels, pounds..	11,500	14,000	17,500	23,000	27,000	32,000
Water capacity of tank, gallons.....	125	150	200	250	325	400
Fuel capacity, { coal, pounds.....	200	200	250	300	350	450
{ wood, cubic feet.....	15	18	20	20	25	25
Weight per yard of lightest rail advised, pounds.....	14	16	16	20	25	30
Radius of sharpest curve advised, feet.....	30	30	35	35	40	35
Radius of sharpest curve practicable, feet.....	15	15	16	18	20	18
Boiler pressure per square inch, pounds.....	150	150	150	150	150	150
Tractive force, pounds.....	1,590	2,290	3,125	4,075	5,160	5,960
Hauling capacity, in tons of 2,000 lbs. (exclusive of locomotive): On absolute level.....	235	345	470	610	775	900
On ½ per cent grade = 26 ½ feet per mile.....	90	130	180	235	295	345
" 1 " " " = 52 ½ " " ".....	50	75	105	140	180	210
" 2 " " " = 105 ½ " " ".....	25	40	55	75	95	105
" 3 " " " = 158 ½ " " ".....	15	25	35	45	60	75

NOTE.—The above figures for hauling capacity are based on a frictional resistance of 6½ pounds per ton of 2,000 pounds. In practice this may run 5 to 10 pounds for good cars and track, or much higher for poor cars and track.

CONTRACTORS' TWO-WAY DUMP CARS

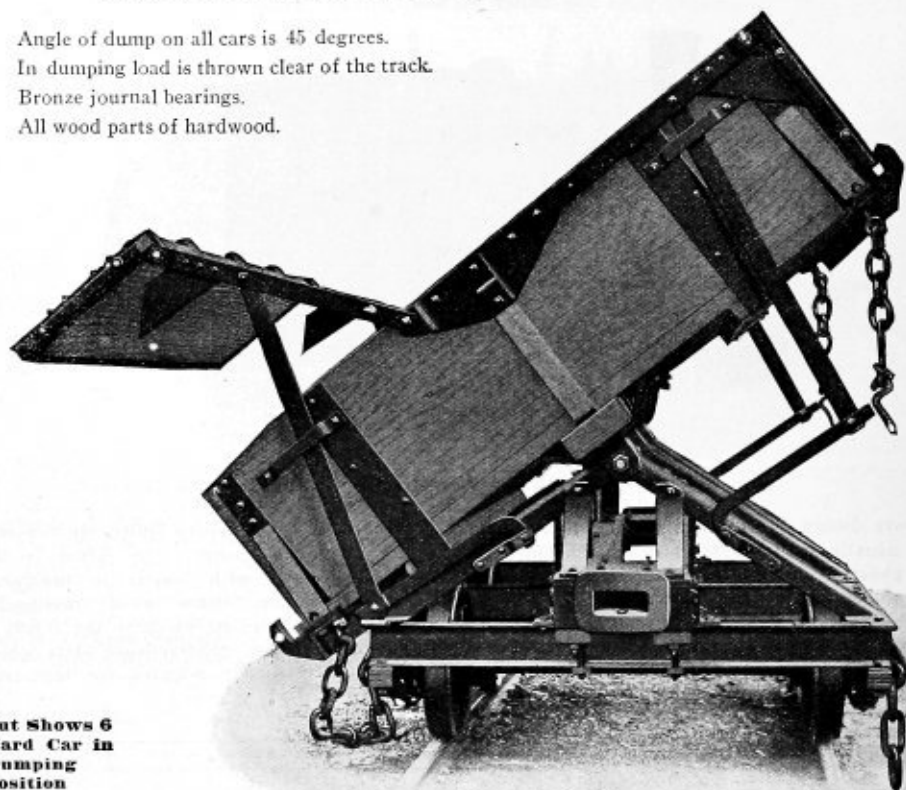
Capacities 1 1-2 to 6 Cubic Yards, Level Full. For Hand or Steam Shovel Work

Angle of dump on all cars is 45 degrees.

In dumping load is thrown clear of the track.

Bronze journal bearings.

All wood parts of hardwood.



**Cut Shows 6
Yard Car in
Dumping
Position**

The trucks of the 3, 4 and 6 yard cars are of the diamond frame type, with heavy I beam cross sills and Pressed Steel Channel Arch Braces. The wheels have faces, bronze journal bearings and springs over axles on 3-yard capacity and larger.

The 1½ yard car has trucks of steel channels and I beams.

The door suspension is patented and of great importance, as it leaves the door free to swing outward if struck by rock or frozen earth, and gives a far greater dumping clearance than can be had with a rigid door, it also avoids the use of a separate lever. The door always locks when returned to carrying position.

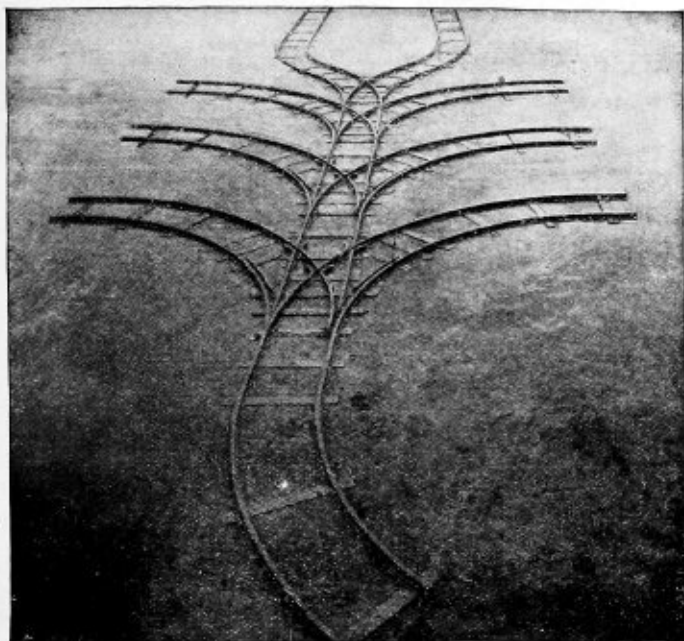
Specifications

Code Word	Capacity, cubic Yards	Track Gauge, inches	Weight of Car, lbs.	No. of Cars to a Carload	Length of Bed Inside, inches	Width of Bed Inside, inches	Depth of Bed Inside, inches	Top of Rail to Top of Draw Bar, inches	Top of Rail to Top of Floor, inches	Top of Rail to Top of Car, inches	Diameter of Wheels, inches	Size of Round Axles, inches	Size of Journal Bearings, inches
Preface	1½	36	2400	12-14	72	72	14	20½	39	53	16	2½	2 5/16 x 6
Prefect	1½	24	2300	12-14	78	60	16	18	34	50	14	2½	2 3/8 x 5
Probing	3	36	4600	8	96	72	20	22½	42	62	16	3¼	3 x 6
Profess	4	36	5000	6	96	77	25	24	48	73½	18	3½	3 x 9
Plumage	6	56½	8400	3	108½	102	26	27½	55	81	24	4½	3½ x 7

Cars furnished with brakes only when specially ordered.

INDUSTRIAL RAILWAYS

The advantages of industrial railways for many different situations we will not comment upon. The reduction in the cost of handling material consequent to their use is a well known and established fact.



We are prepared to furnish them of the highest efficiency at the least expense.

We are prepared to furnish industrial railways made of steel rail, with steel cross ties, with all appurtenances, as curves, frogs, crossings, turntables, etc.

Standard Sectional Track

Our Standard Track is made in twenty to twenty-four (20 to 24) foot lengths of steel rails, secured to steel ties, both of proper strength to obtain durability. The sections of track are made up ready for shipment, thereby avoiding the annoyances to the purchaser of any delicate adjustment when laying it. The track being secured to the cross ties makes the gauge absolutely correct. The gauge of our track is generally made 24 inches between the inner side of rail heads; this, of course, can be varied. Should it be desirable to furnish the track and ties separately, to reduce the freight to distant points, we can furnish a track for these conditions, so as to give the purchaser the least possible trouble in putting it together.

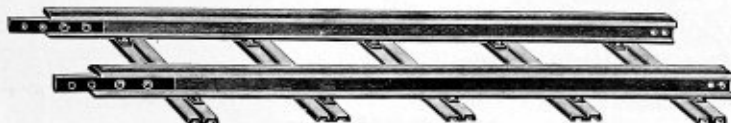
In asking for prices on our system of tracks, it will be necessary for the purchaser to acquaint us with all points in the case; that is to say, length of track desired and maximum load to be carried on each car, radii of curves, style of switches, etc.

To figure intelligently on this system of railways, sketches with accurate dimensions should be mailed to us.

We will be glad to answer any inquiry and make prompt quotations.

INDUSTRIAL OR PORTABLE TRACKS

With Steel Ties, Complete

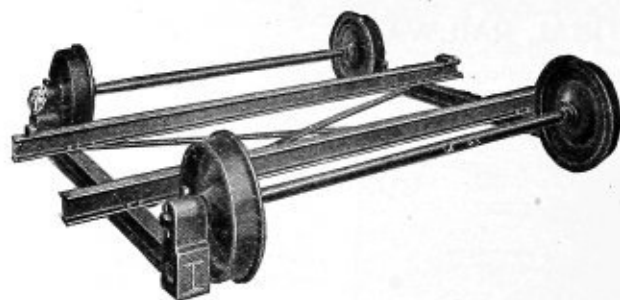


Standard Straight 15-Foot Section of Industrial Track with 5 Ties

Weight of rails, per yard, lbs.	9	9	12	12	12	12	16	16	16	16	20	20	20
Gauge of track, inches.	20	24	20	24	30	36	20	24	30	36	24	30	36
Weight, per foot of track, lbs.	8½	9	11	11½	12	14	15	15½	16	17	18	19	20
Price per foot, complete	\$0.90	\$0.90	\$1.05	\$1.05	\$1.20	\$1.40	\$1.40	\$1.40	\$1.50	\$1.70	\$1.50	\$1.70	\$1.80

Curved sections add 25 cents per foot extra.

Switches and Frogs, Turntables, Crossings, Etc., Quoted Upon Request

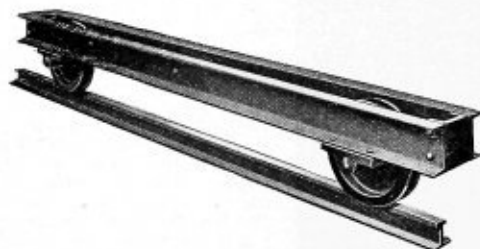


No. 211. TRANSFER CAR With Roller Bearings

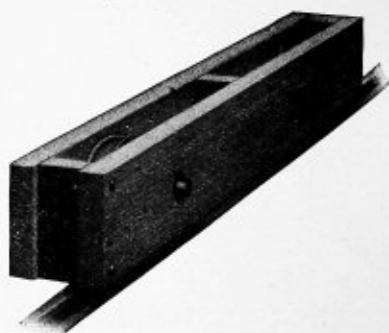
This Car is designed for heavy work and to meet special conditions. The construction enables us to meet various gauges of track and extra long Cars without changing patterns, and are therefore in position to furnish Cars of this style in almost any size.

Prices will be quoted on application giving track gauge of Transfer Car, track gauge and distance between axles on Car to be transferred and maximum load to be carried.

ROLLER BEARING DRY KILN TRUCKS For 16 lb. Rail or Smaller (Used in Pairs)



Style No. 126. Steel

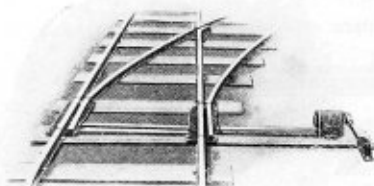


Style No. 125. Wood Frame

Number.....	1	1A	2	2A	3	3A
Length.....	5' 6"	5' 6"	6'	6'	6' 6"	6' 6"
Diameter of Wheel.....	8	12	8	12	8	12
Price, Style No. 125.....	\$ 8.00	9.00	9.00	10.00	10.00	11.00
Price, Style No. 126.....	\$10.00	11.00	11.00	12.00	12.00	13.00

INDUSTRIAL RAILWAY SWITCHES

Can be Used Either Right or Left Hand Without Change



Showing Main Line Connection with Switch Stand

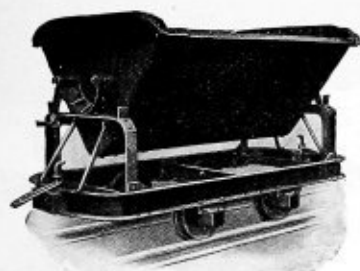


Showing Switch Connection without Switch Stand

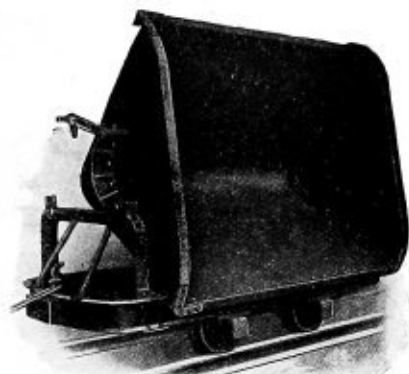
No.	Switch Complete for 12 lb. Rail.....	With Stand	Without Stand
7512	\$22.00	\$16.00
7516	26.00	20.00
7520	32.00	25.00
7525	38.00	30.00
7530	48.00	38.00

The above list includes Track Gauges up to and including 36 inch. Be sure to specify the Track Gauge wanted.

CONTRACTORS' ROCKER DUMP STEEL CARS



No. 425 Car

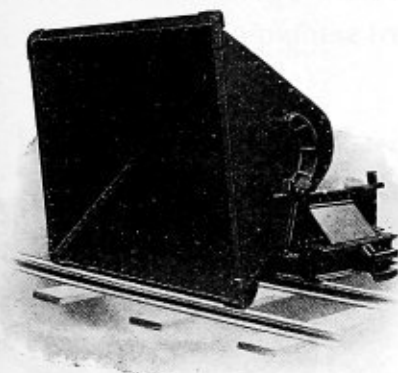


No. 425 Car Dumped

Sizes and Specifications

No.	Capacity Cubic Feet	TRACK GAUGES		OVERALL DIMENSIONS OF REGULAR GAUGE CARS			Diam. Wheels, inches	Diam. Axles, inches	THICKNESS OF BODY PLATES		Approx. Weight, lbs.	Price with Roller or Brass Bearings
		Reg- ular, inches	To Order, inches	Length	Width	Height			Sides, inches	Ends, inches		
421	18	24	18, 20	6 ft. 8½ in.	4 ft. 0 in.	3 ft. 7¼ in.	12	1¼	½	½	900	\$ 74.00
423	27	24	18, 20, 30, 36	7 " 6¼ "	4 " 2 "	3 " 11 "	12	1¼	½	½	950	79.00
424	40	30	24, 36	8 " 1 "	4 " 11 "	4 " 7 "	14	2 "	½	½	1425	105.00
425	54	36	30	8 " 8 "	5 " 3 "	4 " 11 "	14	2¼	½	¾	1775	124.00

Furnished with plain, babbitted, roller or brass bearings as ordered. Charging height is about 4 inches less than overall height. Brakes furnished at extra price.



LARGE SIZE TWO-WAY STEEL ROCKER DUMP CARS

For Locomotive Traction

This car was designed for locomotive traction and is consequently strongly braced and reinforced throughout.

Usually furnished with spring draft rigging and cast steel draw-head.

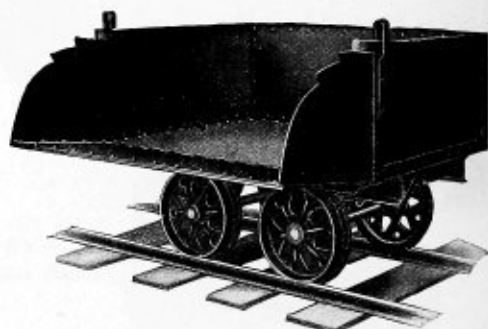
Sizes and Specifications

No.	Capacity Cubic Yards	Gauge of Track	OVERALL DIMENSIONS			Thickness of Plate, inches	Diameter of Axles, inches	Diameter of Wheels, inches	Price
			Length	Width	Height				
426	3	2 ft. 6 in.	9 ft. 9 in.	5 ft. 10 in.	4 ft. 11 in.	¼	2½	14	\$184.00
427	3	3 " 0 "	9 " 9 "	5 " 10 "	4 " 9 "	¼	2½	14	188.00
428	4	2 " 6 "	12 " 3 "	5 " 11 "	5 " 0 "	¼	3	16	270.00
429	4	3 " 0 "	12 " 3 "	5 " 11 "	4 " 10 "	¼	3	16	278.00
430	5	3 " 0 "	13 " 2 "	7 " 0 "	5 " 6½ "	¼	3½	16	296.00
431	5	4 " 8½ "	13 " 2 "	7 " 0 "	5 " 6½ "	¼	3½	16	320.00

H.Channon Company.Chicago.

STEEL COAL CARS AND WAGONS

Popular for Gas-Plant and Boiler Room Use



Coal Wagons—Nos. 346 and 347

Coal Cars—Nos. 17 and 18—30-inch Gauge

COAL WAGONS

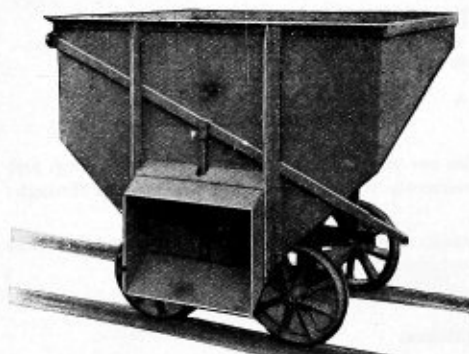
No.	Capacity lbs. Coal	SIZE BODY, INCHES			GAUGE OF STEEL			Diameter Wheels, inches	Diameter Axles, inches	Weight, lbs.	Price Each
		Length	Width	Depth	Sides	Bottom	Ends				
346	500	54	30	13	No. 12	No. 12	No. 12	12	1 3/4 sq.	500	\$66.00
347	1,000	60	56	18	No. 12	No. 12	No. 12	16	1 1/2 sq.	675	84.00

COAL CARS

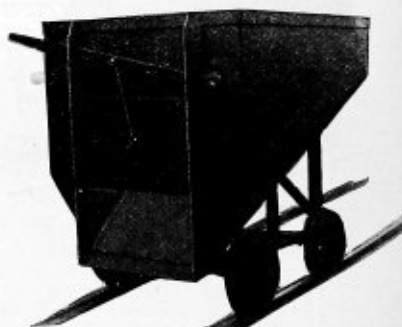
No.	Capacity lbs. Coal	Length	Width	Depth	Sides	Bottom	Ends	Diameter Wheels, inches	Diameter Axles, inches	Weight, lbs.	Price Each
17	2,000	60	54	18	No. 8	No. 8	No. 8	14	1 3/4 rd.	950	\$116.00
18	1,000	50	36	18	No. 8	No. 8	No. 8	14	1 1/2 rd.	650	80.00

Can Be Made with Drop Gate on Each Side or at Rear End if Desired

SIDE AND END DUMPING CARS WITH SLIDING DOORS



Side Dumping Car, Empties Contents Beyond the Track

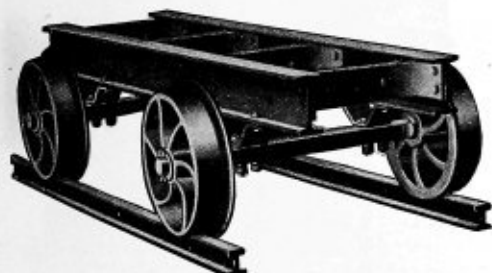


End Dumping Car, Empties Contents Between the Rails

Size Number, Side Dump	Size Number, End Dump	Coal Capacity in pounds	Coal Capacity in cubic ft.	Price
258	270	1,120	22	\$112.50
259	271	1,680	33 1/2	131.25
260	272	2,240	45	156.25
261	273	3,360	67	187.50
262	274	4,480	89	250.00

No. 33 STEEL BILLET CAR

Capacity 2 Tons
For Iron or Steel Billets, Etc.



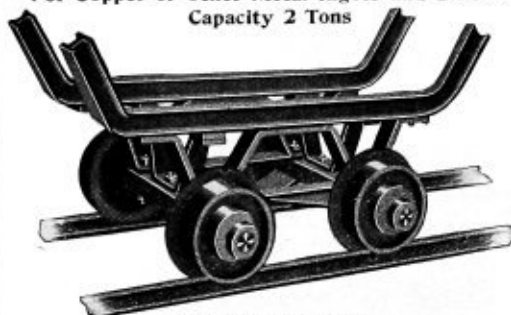
Gauge of Track, 30 inches

Designed especially for handling light billets in iron and steel mills. Frame of 6-inch steel I-beams, length, 7 feet; width, 20 inches; four double cross trusses of steel, $2\frac{1}{2} \times \frac{1}{2}$ inches, riveted together; V-shaped at ends, and double riveted to side sills, as shown in cut; steel axles 2 inches square, wheels 16 inches diameter.

Weight 740 pounds.....Price, \$70.00

No. 720 INGOT CARS

For Copper or Other Metal Ingots and Billets
Capacity 2 Tons



With Roller Bearings

Gauge of track 18 inches, roller bearings of cold drawn steel, length between rails at top 47 inches, width outside rails at top $14\frac{1}{2}$ inches, height from rail to top of T-rack $27\frac{1}{2}$ inches, rack 20-pound T-rails, cross and side axle brackets $2\frac{1}{2} \times \frac{1}{2}$ -inch steel, steel axles $2\frac{1}{4}$ inches square, wheels solid web chilled face, diameter 9 inches, face $3\frac{1}{4}$ inches; cold drawn steel rollers 11-16x4 inches, 12 in each bearing. Weight 475 pounds.....Price, \$60.00

MINING CAGES



STANDARD MINING CAGE

Size of Platform About, feet	Capacity, Pounds	Weight, Pounds	Price
4 x 4	6,000	850	\$200.00
4 x 6	6,000	1,400	250.00

COLORADO LANDING CHAIRS

Working Parts of Forged Steel

Medium.....	Weight, 400 lbs.....	Price, \$ 80.00
Heavy.....	500 " " " " " "	100.00



MINING CAGE, LEADVILLE TYPE

Built entirely of mild steel and Norway iron, all joints machined and fastened together with turned steel bolts, no rivets used. The highest type of cage for severest service.

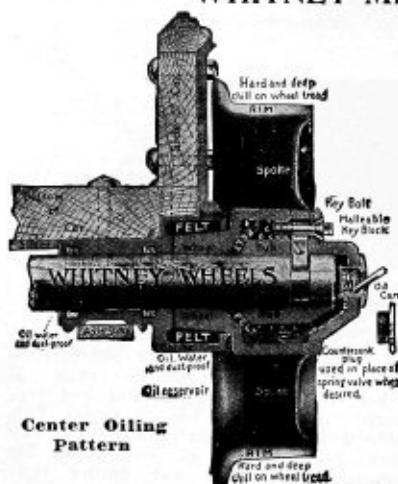
Single-deck cage. Weight, 1,400 lbs.

Price.....\$350.00

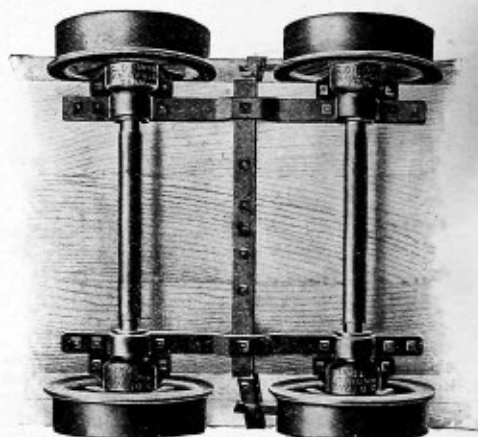
Double-deck cage. Weight, 2,000 lbs.

Price.....\$550.00

WHITNEY MINING WHEELS AND TRUCKS



Center Oiling Pattern



PRICE LIST OF TRUCKS—STYLE "A"

Consisting of 4 wheels, with center-oiling plug bolts, 2 round axles, 4 felt packed boxings and 2 steel axle straps. With center oiling spring valves add \$1.00 per truck.

Size of Axle, inches	Diameter of Wheel, inches	PRICE PER TRUCK, STYLE A								Approximate Weight of each Wheel, pounds	Shipping Weight of Truck 36-inch Gauge, pounds	Extra Weight per Truck for each extra inch of Gauge, lbs.	Width of Standard Wheels, in.	Extra Cost per Truck for Wheels of 1/2 inch wider tread
		24-inch Gauge	26-inch Gauge	28-inch Gauge	30-inch Gauge	32-inch Gauge	34-inch Gauge	36-inch Gauge	38-inch Gauge					
1 3/4	9	\$25.52	\$25.94	\$26.36	\$26.64	\$26.78	\$26.92	\$27.20	\$27.76	36	260	1.37	3	\$0.30
1 3/4	10	26.56	26.98	27.40	27.68	27.82	27.96	28.24	28.80	43	280	1.37	3	.40
2	10	30.50	31.04	31.58	31.94	32.12	32.30	32.66	33.38	49	350	1.78	3	.40
2 1/4	12	29.36	29.78	30.20	30.48	30.62	30.76	31.04	31.60	59	330	1.37	3	.48
2 1/4	12	32.74	33.28	33.82	34.18	34.36	34.54	34.90	35.62	63	410	1.78	3	.56
2 1/4	12	36.34	37.00	37.66	38.10	38.32	38.54	38.98	39.86	69	450	2.25	3 3/4	.58
2 1/2	12	42.98	43.82	44.66	45.22	45.50	45.78	46.34	47.46	82	550	2.78	3 1/2	.52
1 3/4	14	30.64	31.06	31.48	31.76	31.90	32.04	32.32	32.88	64	370	1.37	3	.54
2	14	34.34	34.88	35.42	35.78	35.96	36.14	36.50	37.22	70	430	1.78	3	.54
2 1/4	14	37.86	38.52	39.18	39.62	39.84	40.06	40.50	41.38	76	490	2.25	3 3/4	.64
2 1/2	14	43.66	44.50	45.34	45.90	46.18	46.46	47.02	48.14	90	600	2.78	3 3/4	.94
2 3/4	14	48.36	49.38	50.40	51.08	51.42	51.76	52.44	53.80	100	660	3.38	3 3/4	1.10
3	14	54.30	55.50	56.70	57.50	57.90	58.30	59.10	60.70	112	760	4.00	3 3/4	1.20
3 1/2	14	63.30	65.10	66.90	68.10	68.70	69.30	70.50	72.90	126	920	5.46	3 3/4	1.30
2	16	37.22	37.76	38.30	38.66	38.84	39.02	39.38	40.10	86	470	1.78	3 3/4	.62
2 1/4	16	40.90	41.56	42.22	42.66	42.88	43.10	43.54	44.42	95	550	2.25	3 3/4	.88
2 1/2	16	47.02	47.86	48.70	49.26	49.54	49.82	50.38	51.50	110	650	2.78	3 3/4	1.10
2 3/4	16	51.80	52.82	53.84	54.52	55.20	55.54	55.88	57.24	120	740	3.38	3 3/4	1.15
3	16	57.70	58.90	60.10	60.90	61.30	61.70	62.56	64.10	130	800	4.06	3 3/4	1.20
3 1/2	16	65.70	67.50	69.30	70.50	71.10	71.70	72.90	75.30	140	970	5.46	3 3/4	1.40
2	18	39.62	40.16	40.70	41.06	41.24	41.42	41.78	42.50	98	560	1.78	3 3/4	.70
2 1/4	18	43.46	44.12	44.78	45.22	45.44	45.66	46.10	46.98	110	600	2.25	3 3/4	.88
2 1/2	18	49.50	50.34	51.18	51.74	52.02	52.30	52.86	53.98	125	700	2.78	3 3/4	1.26
2 3/4	18	54.60	55.62	56.64	57.32	57.66	58.00	58.68	60.04	135	790	3.38	3 3/4	1.40
3	18	59.20	60.40	61.60	62.40	62.80	63.20	64.00	65.60	140	870	4.00	3 3/4	1.50
3 1/2	18	66.90	68.70	70.50	71.70	72.30	72.90	74.10	76.50	146	1000	5.46	3 3/4	1.60

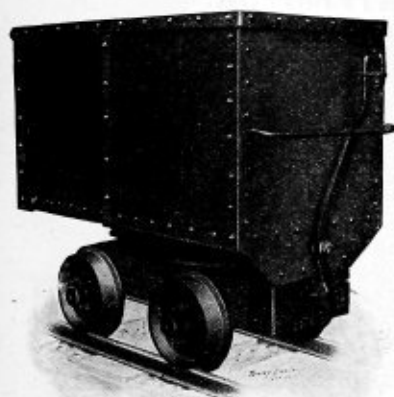
IN ORDERING STATE—(1) Style of Truck. (2) Size of Axle. (3) Diameter of Wheel.

(4) Wheel Base, or distance axles are spaced apart on centers.

(5) Track Gauge (the exact distance between heads of rails inside).

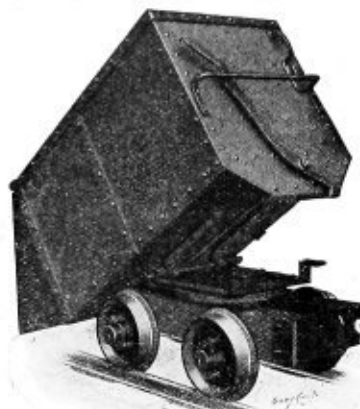
(6) State whether wheels are desired with solid center plug bolt or with patent malleable spring cage oiling device, or with old side plug.

STANDARD STEEL ORE CARS LEADVILLE TYPE. DUMPS AT END OR ON EITHER SIDE. 18-INCH GAUGE



Suitable for
General Mining,
Shaft or
Cage Use

A single lever operates
the hinged door and
locks the body to the
car frame

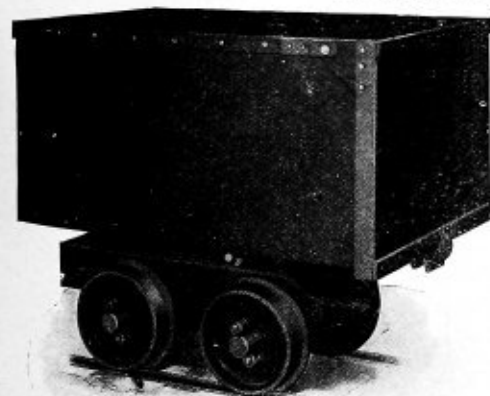


Wrought Steel Turntable; Truck Frame either of oak or steel, as specified. Wheels are chilled cast iron with extra wide tread, fitted with malleable self-oiling, dust proof caps. Axles are square steel.

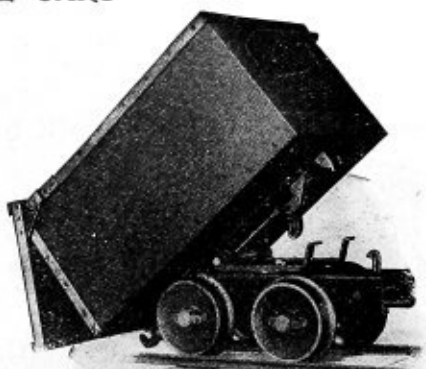
Car Number	Capacity in Cubic feet	DIMENSIONS OVER ALL			GAUGES OF STEEL			Diam. Wheels, inches	Size Square Axles, inches	Weight, lbs.	PRICE EACH	
		Length in inches	Width in inches	Height in inches	Sides	Bottom	Door				Wood Truck	Steel Truck
554	12	49	29	36	No. 12	No. 10	No. 10	10	1 1/4	495	\$52.00	\$51.00
555	14	49	29	39	" 11	" 8	" 8	10	1 1/4	535	56.00	55.00
556	16	53	29	42	" 10	" 8	" 8	10	1 3/8	595	60.00	59.00
557	20	53	35	42	" 8	3/8 in.	3/8 in.	12	1 3/8	715	66.00	65.00
558	24	53	37	45	3/16 in.	1/4 in.	1/4 in.	12	1 1/2	840	71.00	70.00

Can be provided with false bottoms at extra price.

AUTOMATIC ORE CARS



Platform
of
Heavy
Steel
Plate
Stamped
in
One
Piece



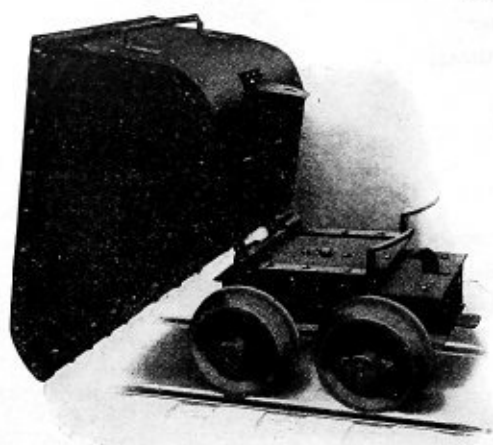
The door hook is hinged to a rod, the joint sliding in a yoke. The rod is controlled by a cam lever, pivoted to its opposite end, supported by a bracket and against the face of the turntable when the car is upright.

On tipping the car body the cam lever descends, allowing the door to be opened by the weight of the load. Righting the car body securely locks the door.

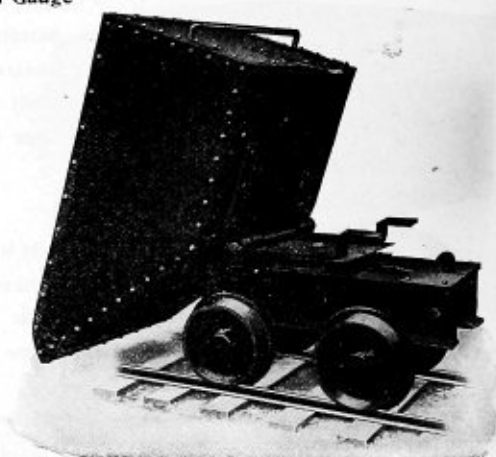
Car Number	Capacity in Cubic feet	DIMENSIONS OVER ALL			BODY OF CAR			GAUGE OF STEEL			Size of Wheels, inches	Size Square Axles, inches	Weight, lbs.	Price, Each
		Length in inches	Width in inches	Height in inches	Length in inches	Width in inches	Depth in inches	Sides	Bottom	Door				
559	12	49	30	37	44	24	20	No. 12	No. 10	No. 10	10	1 1/4	460	\$46.00
560	14	49	30	40	44	24	23	" 11	" 8	" 8	10	1 1/4	500	49.00
561	16	53	30	42	48	24	24	" 10	" 8	" 8	10	1 3/8	560	52.00
562	20	53	36	42	48	30	24	" 8	3/16 in.	3/16 in.	12	1 3/8	675	59.00
563	24	53	38	45	48	32	27	3/16 in.	1/4 in.	1/4 in.	12	1 1/2	780	64.00

SCOOP BOX ROTARY STEEL DUMP CARS

18-Inch Gauge



Nos. 572 and 573

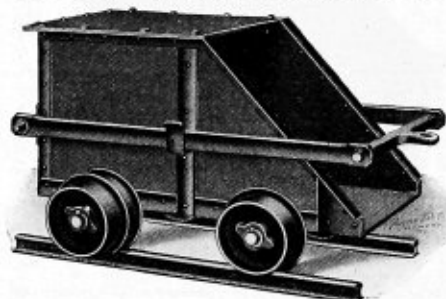


Nos. 574 and 575

Body is supported on a wrought steel turntable, and is securely locked to the truck by a treadle catch. When unlocked body is swung on its turntable, permitting the load to be dumped at the end or at either side.

No.	Capacity, cubic feet	OVER ALL DIMENSIONS			GAUGE OF STEEL			Diameter Wheels	Size of Axles	Weight, lbs.	Price Each
		Length	Width	Height	Sides	Bottom	Door				
572	8	44	28	33	No. 12	No. 10	No. 10	10	1½ Sq.	350	\$68.00
573	12	47	28	39	" 12	" 10	" 10	10	1½ Sq.	410	72.00
574	18	58	32	44	" 10	" 8	" 10	12	2 Rd.	850	92.00
575	21	58	32	48	" 8	⅞ in.	" 8	12	2 Rd.	900	98.00

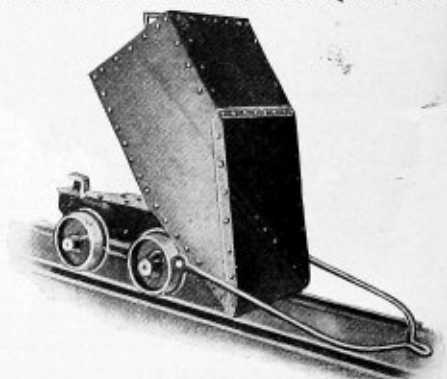
No. 577 AUTOMATIC ORE SKIP



Capacity—12 cu. ft. or 1,300 lbs. of ore. Length of box on top 28½ in., on bottom 48 in. Width, 24 in. Depth, 22 in. No. 8 steel. Center band 2½ x ½ in., angles at corners 2 x 2 x ¼ in., and at top and opening 1½ x 1½ x ¼ in. Reinforcing plate 6 x ¼ at open end under bottom and turned up on sides. Bail 2½ x ¼, draft bar 1½ in. sq. Axles 1½ sq. Wheels 12 in. x 2½ tread. Gauge 24 in.

Larger sizes quoted upon request. Weight, 720 lbs. Price.....\$85.00

No. 581 COMBINED CAR AND SKIP



Box made of No. 12 steel. Length, 48 in. Width, 24 in. Depth, 20 in. Top band, 1½ x ¾ in. Truck frame, 5½ x ¼ in. steel. Connecting angles, 1¼ x 1¼ x ⅝ in. 10-inch chilled face wheels on 1½ in. axles. Handle ¾ round. Bail 1 in. round. Gauge of track 18 in. Weight, 525 lbs. Price.....\$65.00

AUTOMATIC END DUMP QUARRY CARS

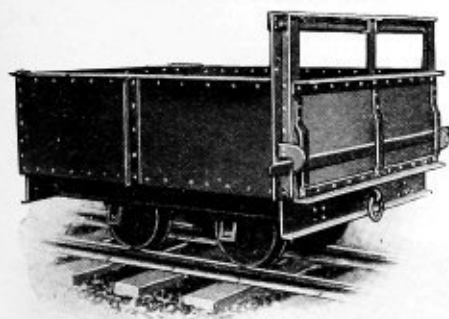


Fig. 608. Steel Car



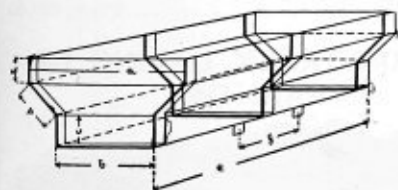
Fig. 613. Wood Car

Made in sizes 1 yard to 3 yards capacity of either steel or wood to suit purchaser's requirements. Track gauges usually 30 to 48 inches. Wood cars are of oak and may be had with steel lining if desired.

Be sure to state in inquiring for prices—Number of cars wanted; track gauge; whether all steel or wood; if wood, whether lining is wanted; if so, on bottom only or throughout inside; kind of material to be handled; kind of wheels and bearings preferred, and what limitations to size of car, if any.

COAL MINE CARS

Built to order only, of either steel or wood, to special proportions and of any gauge of track, in capacities from 20 to 80 cubic feet. We furnish plain or chilled wheels, with or without self-oiling hubs.



Dimension Diagram

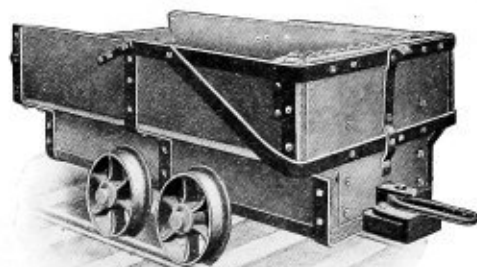


Illustration shows Style M Car, Cast or Steel Bumper

INQUIRY BLANK

State number and style wanted and gauge of track.
Style and diameter of wheel.

Kind of axle—square or round.

Distance "F" (centers of axles).

When wheels are tight on axles give information as to inside or outside bearings, and state kind of oil boxes desired; also give length and diameter of journal.

Capacity in cubic feet level full (about 40 cubic feet to the ton).

Distance "a" "b" "c" "d" "e" in dimension diagram.

Distance "h" when extra vertical plank is used.

Distance between bumpers of four-bumper cars.

Height that car is wooded up in rear end above bottom plank.

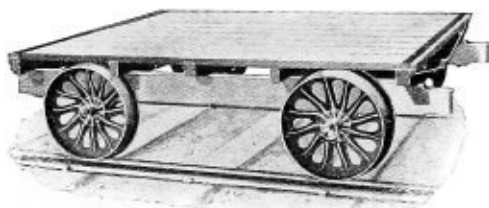
Thickness of bottom and side planks.

Size of iron for front, center and rear binders or belts.

Bumpers, side or center and size of iron.

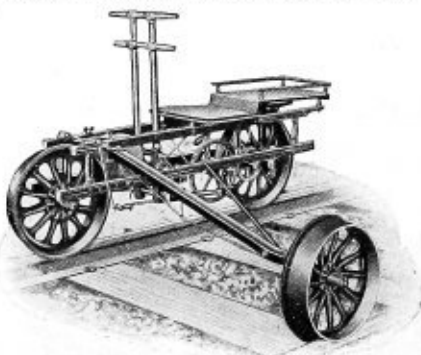
Size of rear cross binder.

Diameter of hole in end of draw-bar.

No. 65 RAILROAD PUSH CARS

Extra heavy; standard gauge; platform 7 feet long by 5 feet 7 inches wide; pressed steel wheels 20 inches in diameter; machine steel axles 2 inches in diameter.

Weight 700 lbs.....Price, \$40.00

RAILROAD VELOCIPEDES

Light, durable and easily operated and handled. Built of tough rock elm, with patent single-plate pressed steel wheels, with ball bearings.

NO. 1 STANDARD

As shown by Illustration above.

Weight 150 lbs.....Price, \$70.00

NO. 2 VELOCIPEDE

For two persons. Same style as No. 1, but with seat for passenger.

Weight 158 lbs.....Price, \$73.00

NO. 3 TELEGRAPH CAR

For three persons. Can be operated by one man, if desired. Has box for carrying tools and supplies.

Weight 195 lbs.....Price, \$90.00

RAILROAD HAND CARS

With Pressed Steel Wheels

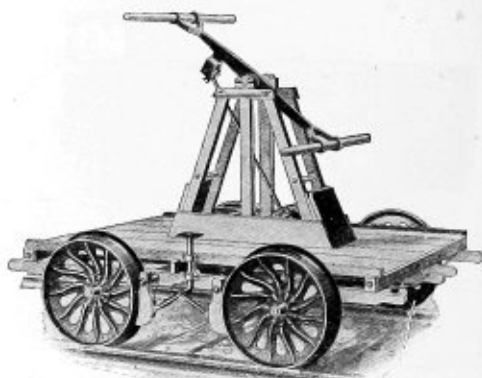


Illustration Shows No. 1 Car

NO. 1 STANDARD HAND CAR

Standard gauge; platform 6 feet long by 4 feet 5 inches wide; wheels 20 inches in diameter; axles 1½ inches diameter.

Weight 500 lbs.....Price, \$60.00

NO. 2 BRIDGE GANG CAR

Standard gauge; platform 8 feet long by 5 feet 7 inches wide; axles 1½ inches diameter.

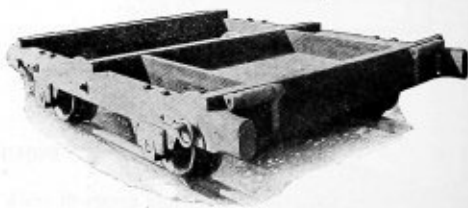
Weight 700 lbs.....Price, \$72.00

NO. 5 INSPECTION CAR

For use of roadmasters and supervisors of track, bridge builders, etc.

Same size platform as No. 1 car. Furnished with single or double end lever, as desired.

Weight 475 lbs.....Price, \$80.00

10-TON TRACK LAYING OR RAIL CAR

Standard gauge; size, 8 feet long by 6 feet 6 inches wide; chilled wheels 16 inches in diameter, with 6-inch tread; axles, 2¾ inches in diameter; capacity, 10 tons; sills, 4x8-inch oak; cross sills plated with iron; car fitted with chain and tool boxes, and has two rollers at each end.

Weight about 2,000 lbs.....Price, \$120.00

FOUR-WHEEL LIGHT INSPECTION CARS

BALL BEARINGS THROUGHOUT



Single-seated Car, Built any Gauge



Double-seated Car, Gauge 3 Feet and Larger

The single-seated car is fitted with detachable luggage basket and tool bag. Geared to suit grade conditions. The standard gear is 62; options of 52, 58 or 73. Net weight, 65 lbs. Shipping weight, crated, 100 lbs. Price.....\$65.00

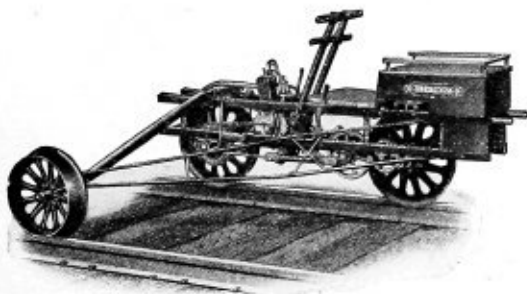
The double-seated car is geared same as the single seated. Net weight, 75 lbs. Crated for shipment, 125 lbs. Price.....\$85.00

Detachable front seat for either car; weight, 15 lbs. Extra..... 7.50

No. 10 MOTOR VELOCIPED

Engine 2 1/4 H. P. Air-Cooled. Speed 4 to 20 Miles per Hour

Can Be Handled by One Man On or Off Track



Gasoline Tank Holds Supply for Two Hundred Mile Run

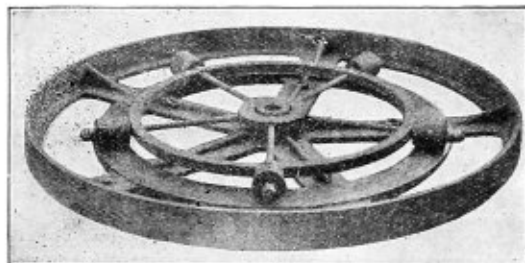
Car is driven by a special roller chain with nickel steel rivets. Chain has a strength of 2,500 lbs. Sprockets are provided with friction device so that in case of undue slack chain will not break.

The Frame is of selected Ash; wheel base is 46 inches; pressed steel wheels, 17 inches diameter; light and strong.

Starts without cranking. Equipped with five-cell dry battery and waterproof spark coil; has gravity sight-feed lubricator. Price.....\$250.00



Standard Flat



Showing Base Plate and Chilled Rollers with Cover removed

"PLANET" TURNTABLES

"Easiest Turning"

Designed for practical shopmen who want a turntable that is self-contained; that will turn lightly; that will not rattle or tip; and that at the same time is heavy and substantial; and that will keep in order and keep itself clean.

It is of the conical roller type; rollers are chilled and carry entire weight on machined circular tracks. Rollers cannot rub together. All grinding friction is avoided. Recommended for mine and shop tracks, street car use, freight houses, and wherever a substantial and practical turntable is required.

The foundation plate is a single casting and the roller tracks cannot get out of alignment. These circular roller tracks are machined, and the entire table is well finished and substantial.

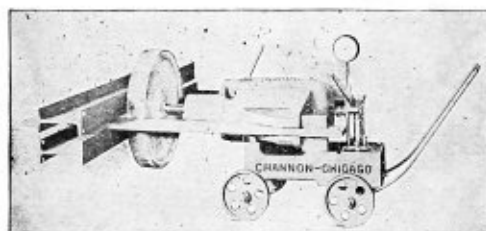
Rails either raised or grooved may be cast on top at a slight extra cost. Frogs, sometimes used to guide trucks on or off table, are extra.

Diameter of Table	Total Depth	Approximate Weight	USUAL GAUGES OF TRACK USED WITH LONGEST WHEEL BASE OF TRUCK THAT CAN BE USED ON EACH TABLE. INCHES						Price, Standard Flat Checkered Top Tables Each	Frogs, Extra, Per Pair
			Ga.	W.B.	Ga.	W.B.	Ga.	W.B.		
3 feet	4½ inch	500 lbs.	18	28	21	26	..	..	\$ 35.00	\$2.50
4 "	5 "	700 "	18	38	21	35	24	32	48.00	2.50
5 "	6 "	1,250 "	21	44	24	42	30	38	75.00	2.50
6 "	7½ "	2,300 "	21	63	24	60	30	58	150.00	3.00
8 "	9 "	4,200 "	30	84	36	78	56½	63	265.00	3.50

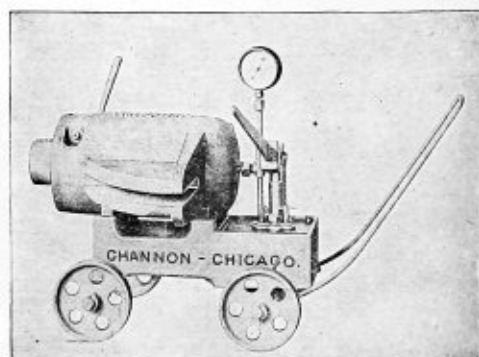
Dimensions apply to standard flat checkered top tables.

Can be furnished with grooved or raised rails at 10% added to list above. If ordered with rails, be sure to state gauge of track wanted.

No. 2 PORTABLE HYDRAULIC PRESS



Showing Press, Pump, Oil Tank, Cylinder and Gauge complete in operation with Beams and Side Bars, for pressing on or off Cranks, Car Wheels, Couplings, etc.



Without Beams and Side Bars

Capacity	RAM		Opening Between Bars	Height of Center of Ram	Weight	Price without Beams and Side Bars	Price with Beams and Bars
	Diameter	Stroke					
60 tons	6 inch	14 inch	36 inch	18 inch	1,600 lbs.	\$250.00	\$281.25
100 "	7 "	14 "	36 "	19 "	1,800 "	300.00	341.25

100 ton is favorite size for general use and is carried in stock. 60 ton size furnished in 2 to 3 weeks.

CAST IRON FLANGED CAR WHEELS



Gray Iron Wheels

Diam., inches	Width, inches	Tread, inches	Length of Hub, inches	Bore, inches	Weight lbs.	Price Each
8	2 3/8	1 7/8	2 1/4	3/4	16	\$ 2.00
8	3 3/8	2 1/2	3 1/2	1 1/8	20	2.50
9 3/4	3	2 1/2	3 1/2	1 3/8	19 3/4	2.50
10 1/4	2 1/2	1 7/8	3	1 1/8	18 1/2	2.25
12	.....	2 3/4	5	1 7/8	36	4.50
12	2 1/2	1 7/8	3 1/2	1 1/4	24	3.00
14	2 3/8	2 1/4	3 1/2	1 3/8	43	5.35
14	3	2 3/4	3 3/4	1 3/8	46	5.75
14	4	3	5	2	60	7.50
16	3	.....	.....	1 3/4	41	5.00

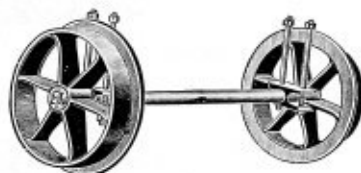
Chilled Face Wheels

Diam., inches	Width, inches	Tread, inches	Length of Hub, inches	Bore, inches	Weight lbs.	Price Each
10	3 3/8	2 1/4	4 3/8	1 1/2	30	\$ 3.75
10	.....	2 3/4	4 3/8	1 1/2	44	5.50
12	3 3/8	2 1/4	4 3/8	1 1/2	38	4.75
12	.....	2 3/4	4 3/8	1 1/2	56	7.00
14	3 3/8	2 1/2	4 3/8	1 1/2	53	6.25
14	3 3/8	2 1/2	4	1 3/4	51	6.00
16	.....	3 5/8	5	2 3/8	108	10.80
16	.....	3 5/8	4 3/4	2 3/8	126	12.50
18	.....	3 1/2	.....	2 1/4	130	13.00
20	.....	3 1/2	.....	2 1/2	150	15.00

When ordering wheels and axles, give exact distance between tracks, and we will make the necessary allowance for play. If ordering wheels for old axles, give distance between hubs.

The general gauge of track is 18 inches; the distance from flange to flange is then 17 1/2 inches, leaving one-half inch play. Gauges of any size to order.

LUMBER TRUCK WHEELS

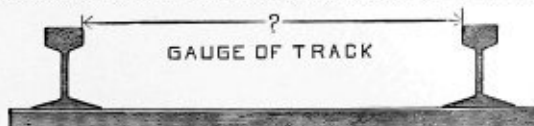


The price list, includes four wheels, two axles, four boxes and eight bolts for 10-inch timbers. The wheels run loose on axle, and are held in position by the boxes on inside, and the washers and cotter pin on the outside of wheels. The prices are based on 3-foot gauge track. When ordering give distance between tracks.

Diameter of wheel.....	10	12	14	16	18	20	24
Tread	3 1/2	3 1/2	3 1/2	4	4	4	4
Diameter of axle.....	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Price, per set	\$35.00	\$40.00	\$45.00	\$52.50	\$60.00	\$67.50	\$75.00

GAUGE OF TRACK

is distance from inside head of rail to inside head of rail as per sketch shown below.



H. Channon Company, Chicago.

BLASTING MATERIALS

DYNAMITE

25% Nitroglycerine.....	\$23.00 per cwt.
30% ".....	24.00 "
35% ".....	25.00 "
40% ".....	26.00 "
45% ".....	27.00 "
50% ".....	29.00 "
60% ".....	32.00 "

Sold in 50-lb. cases only.

Ammonia Dynamite—same prices.

Gelatine Dynamite—add \$1 per lb.

25% is used for clay, shelly rock, frozen earth and in quarries for splitting rock.

30 to 40% for moderately hard rock, copper, lead and other ores, stumps and ice.

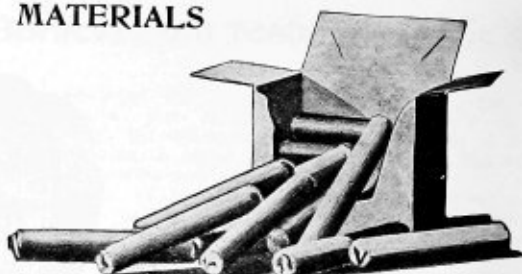
40 to 50% for hard rock, ores and iron.

60% for extremely hard rock, ores, breaking iron and steel, and submarine blasting.

CONTRACTORS' POWDER

The contractors' powder is similar in appearance and composition to common blasting powder, and is used in much the same manner and for the same purposes as that article, differing in the respect that it is fully 50 per cent stronger, and combines the pushing or lifting effect of black powder with the shattering force of dynamite. Put up in 12½-lb. paper bags, packed in 50-lb. cases. We do not break cases.

It is largely used for blasting clay, frozen earth, rock, stumps, etc. Price per 100 lbs., \$15.00.



N. Y. BLASTING BATTERIES

No. 2 —1 to 15 holes.....	\$15.00
" 3 —1 " 25 ".....	25.00
" 3½ —1 " 30 ".....	35.00
" 4 —1 " 50 ".....	50.00
" 5 —1 " 60 ".....	65.00

Capacity figured on 20 ft. exploders.

Springing holes with a large battery is not good practice.

Contractors should always use a No. 2 battery for springing, keeping in reserve the large battery to pull off the big blast.



THE BLASTER'S FRIEND OR CIRCUIT TESTER

Fits the Pocket.

Misfires, premature explosions, and other blasting mishaps are, as a rule, caused by defective exploders or by imperfect wire connections at one or more points of the circuit.

This instrument is for testing each exploder before inserting in cartridge. Price.....\$10.00



SUNDRIES

ELECTRICAL FUSES—PER 100

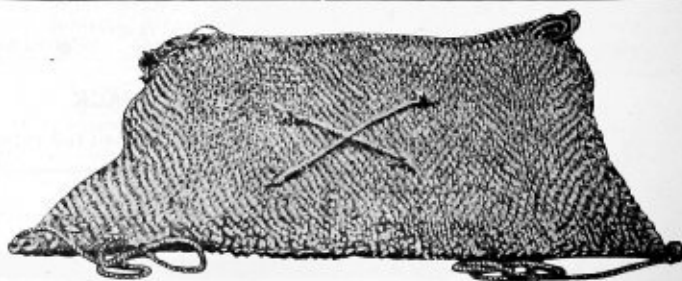
Double wound insulation. Warranted perfect.

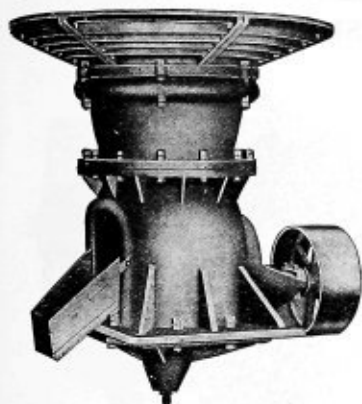
4 Foot Wires	Standard Strength	Double Strength
4 " ".....	\$ 3.00	\$ 3.75
6 " ".....	3.54	4.29
8 " ".....	4.08	4.83
10 " ".....	4.62	5.37
12 " ".....	5.16	5.91
14 " ".....	5.70	6.45
16 " ".....	6.24	6.99
18 " ".....	6.78	7.53
20 " ".....	7.32	8.07
24 " ".....	9.32	10.67
28 " ".....	11.32	12.67
30 " ".....	12.32	13.67

Single Tape Fuse.....	\$4.50 per 1,000
Double Tape Fuse.....	5.50 "
Triple Tape Fuse.....	6.50 "
Caps—Quadruple Force.....	8.00 "
Caps—Quintuple Force.....	8.75 "
Leading Wire, Common, per 500-foot coil.....	\$5.00
" " Aetna, per 500-foot coil.....	5.00
Connecting Wire, in 1-lb. coils or 2-lb. spools, per lb.....	.40
Leading Wire Reels, each.....	4.00
Rubber Insulating Tape, per ½-lb. roll.....	.75
Friction Tape.....	.50

WOVEN MANILA ROPE BLASTING MATS

These blasting mats are used in cities for covering over holes where the blast is to be made, to keep the small stones or spalls from flying up and injuring workmen and surrounding property. We make these mats to order of any size and diameter of rope.





GYRATORY ROCK AND ORE CRUSHERS

With Automatic Oiling System

In estimating power required for crushers ample provision has been made for driving elevator and screen.

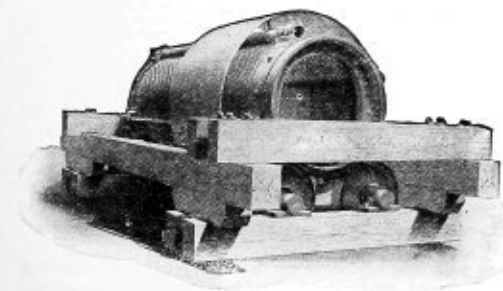
An accurate estimate cannot be made that will cover all classes of materials. Very hard rock will diminish the capacity. It takes more power per ton to break the rock to 1 inch than to $2\frac{1}{2}$ inches and larger. For fine crushing add liberally to the power. The general rule for crushing the hardest stone to sizes mentioned is 1 H. P. per ton of stone broken per hour.

Always state the kind of stone or ore to be crushed, the grade of fineness required and the capacity wanted per hour in tons or yards.

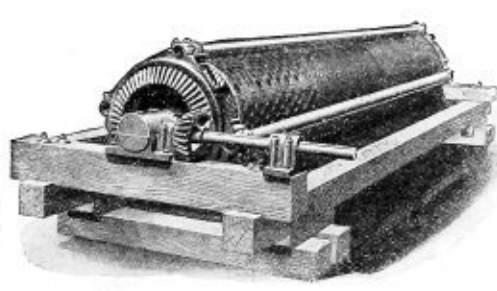
Weights, Capacities and Power Required

No.	DIMENSIONS RECEIVING SPIDER OPENINGS, INCHES		CAPACITY IN TONS OF 2000 LBS. VARYING WITH KIND OF ROCK		SPEED AND SIZE DRIVING PULLEY, INCHES			H. P. for Crusher, Elevator and Screen	Approx. Weight of Crusher, lbs.	List Price with Reg. R. H. or L. H. Drive	Add Extra for Back Gear
	Each About	Both About	Tons per Hour	To Pass Diam. Ring	Diam.	Face	R. P. M.				
2	8 x 22	8 x 44	5 to 10	21	24	8	450	12 to 15	10,000	\$1,000.00	\$ 50.00
3	8½ x 24	8½ x 48	10 " 20	2½	28	10	425	20 " 25	15,500	1,500.00	65.00
4	9 x 27	9 x 54	15 " 30	2½	32	12	400	25 " 30	23,500	2,000.00	81.00
5	12 x 35½	12 x 71	25 " 50	2½	36	14	375	30 " 50	32,000	2,700.00	88.00
6	12½ x 37	12½ x 74	45 " 90	3	40	16	350	40 " 60	44,000	3,500.00	95.00
7½	14 x 44	14 x 88	90 " 150	3½	44	18	350	75 " 125	67,500	5,000.00	105.00
8	19 x 60	19 x 120	130 " 225	4	48	20	350	100 " 150	100,000	7,000.00	.....

STANDARD ROCK SCREENS



Showing Receiving End and Dust Jacket



Showing Driving End and Gearing

No.	Diameter, inches	Length, feet	Weight, lbs.	List Price
36	32	8	3,800	\$ 460.00
37	32	10	4,300	500.00
38	32	12	4,500	540.00
39	40	8	5,100	650.00
40	40	10	5,400	720.00
41	40	12	5,600	790.00
42	40	14	6,400	850.00
43	40	16	6,600	930.00
44	40	20	7,400	1,100.00
45	48	12	9,300	1,050.00
46	48	14	10,000	1,130.00
47	48	16	11,000	1,210.00
48	48	20	12,500	1,300.00

Stone Elevators, Cars and Friction Hoists, listed elsewhere in Catalogue

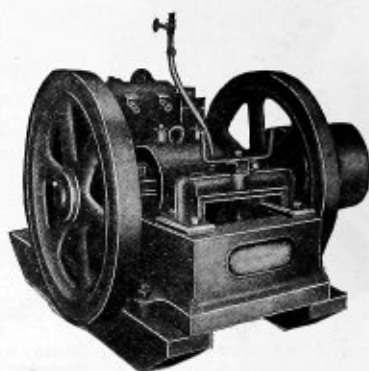
NEW CENTURY BLAKE CRUSHERS

This Crusher is of the well known Blake type. The steel eccentric shaft is of large diameter in the bearings which are self-lubricating, being oiled with a chain oiler constantly running through an oil well cored out of the casting underneath them.

Wright's patent Arctic Bumper is exclusively used. This eccentric bumper is cored out above the eccentric shaft bearing and a current of cold water is permitted to flow through it, entering by means of the hose shown in the cut, enabling the crusher to be run continuously at from 300 to 400 revolutions per minute.

The wedge block at the rear end of the Crusher is about twice as long as that of any other make, and is held in position by the bridge spanning the bed, as shown in the cut. This long wedge block enables the jaws to be entirely worn out without changing the toggle plates.

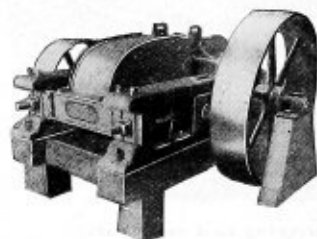
False removable side plates are placed on the inside of the crusher bed, opposite that portion of the bed where the movable jaw oscillates. The chilled jaws are made of the best possible mixture of guaranteed cold blast charcoal iron. Machines are provided with tight and loose pulleys if desired.



Size of Jaw Opening	Capacity, Tons per 24 Hours	Weight	Size of Pulley	Revolutions per Minute	Diameter of Shafts in Eccentrics in Inches	Horse Power Required	Thickness of Metal Through Bed	Price
7x10	75 to 125	6,000	20x8	400	4 7-16	6	5 in.	\$ 435.00
9x12	100 to 150	8,000	20x8	400	4 7-16	8	6 in.	520.00
9x15	175 to 250	12,000	20x10	350	5 3-16	12	9 in.	660.00
12x18	300 to 400	21,000	30x12	300	6 15-16	16	11 in.	1,250.00
12x20	350 to 500	25,000	30x12	300	8	20	11 in.	1,460.00
12x24	500 to 800	28,000	30x14	300	8	25	11 in.	1,665.00

NEW CENTURY BELT DRIVEN ROLLS

Cornish Type



The rolls can be set to crush to any degree of fineness.

The Latrobe tires are drawn over the cores, which are turned true to the inside taper of the tires, and well secured.

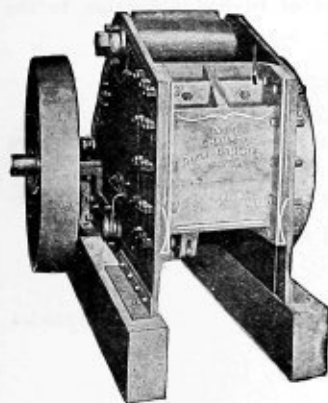
The choice of tires depends upon the character of crushing to be done. If the material is coarse, coming from jaw crushers and is required to be but partially reduced, i. e., to sizes down to quarter inch, we recommend the chilled tires. They are white hard clear through, yet are very tough and homogeneous, and rarely chip.

Where fine grinding is necessary, as in the case of middlings or the preparation of material for fine concentrators, turned steel tires should be used. Can furnish heavy spur geared drive at same price as belted.

Diameter and Faces of Tires	Capacity in Tons per 24 Hours	Weight in Lbs.	Size of Pulleys	Revolutions per Minute	Diameter of Roll-Shaft	Weight of Larger Pulley	Price	
							Chilled Iron Tires	Turned Steel Tires
19x14	25 to 50	5,000	36x10 24x10	90	3 15-16	585	\$ 450.00	\$ 635.00
24x14	50 to 100	8,000	48x10 30x10	80	4 7-16	765	625.00	860.00
30x14	100 to 200	12,500	60x12 36x12	75	4 15-16	1,700	810.00	1,080.00
36x14	200 to 400	18,000	66x12 40x12	70	4 15-16	2,200	1,130.00	1,450.00

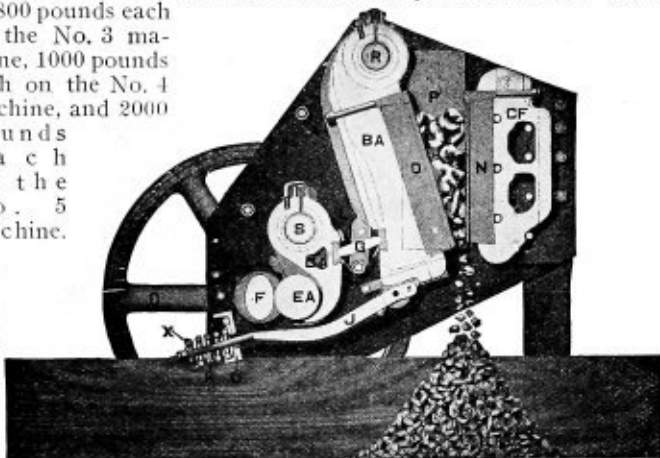
Geared or Belt Driven Rolls Same Price

CHAMPION CRUSHERS



A. Main Frame. The main frame, or sides of the crusher, is of two pieces of homogeneous steel of great strength, which insures against the breakage of any heavy or expensive parts, as these sides receive the entire tensile strain.

In all Champion Crushers the power is exerted upon the moving jaw B, through the rolling action of the double cam-shaft F, anti-friction roller E, tumbler D and toggle G, thus giving two forward grips of the jaw to each revolution of the shaft. This shaft is located near the base of the machine, and has on either end a heavy, wide-rimmed wheel of 800 pounds each on the No. 3 machine, 1000 pounds each on the No. 4 machine, and 2000 pounds each on the No. 5 machine.

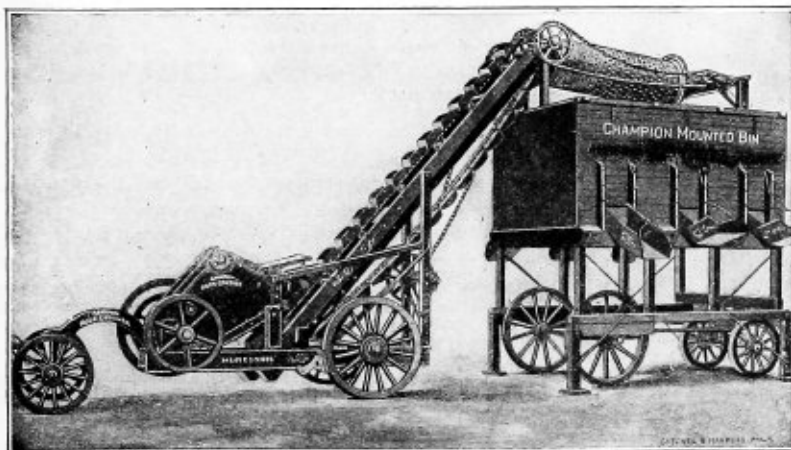


Sectional View No. 14 Crusher

No.	Size or Receiving Capacity of Jaws, inches	Capacity in Tons per hour, Jaws closed to 2 inches	DRIVING PULLEYS			Horse Power Required	Floor Space, feet	Approx. Weight, lbs.	Price, Crusher only
			Diam.	Face	R.P.M.				
3	7½ x 13	8 to 12	38	8	170	12	4½ x 5½	6,000	\$ 600.00
4	9 x 15	12 " 18	48	9	155	15	5½ x 6½	8,500	750.00
15	10½ x 22	18 " 30	48	9	150	20	7 x 7	13,000	1300.00
5	11 x 26	24 " 30	60	9½	140	25	6½ x 8½	19,000	1650.00

COMPLETE CHAMPION CRUSHING OUTFIT

Prices quoted upon request, specifying size of Crusher, kind of Rock and size of Product Wanted



The Champion Steel Rock Crusher, mounted, with Elevator Revolving Screen and mounted Telescopic Bin

H.Channon Company. Chicago.

"MORSE" IMPROVED DIVING APPARATUS

We are Western Agents for A. J. Morse & Son, Sole Manufacturers of Diving Apparatus to the United States Navy and Engineer Corps

For Wrecking

Deep Sea Diving

Shallow Diving

Pearl, Shell or Sponge

Diving

For Depths of 15 to 187 Feet



Diver in Armor

For Diving in Rivers, Harbors

For Water Works Examinations and Repairs

Used by Towing Companies

Dry Docks

Bridge Builders

Railroads

Mines, Etc.

"There is Nothing too Good where Life is at Stake." "Morse" Apparatus is the Best

The armor consists of helmet to protect the head; dress, of canvas and rubber, attached to the helmet; shoes, with lead or iron soles to keep the feet down, and the body upright; lead weights to sink the diver to the bottom and prevent his rising from an over-pressure of air from the pump.

The life line is used in lowering or raising the diver, and for transmission of signals between the diver and his attendant.

The diver is first dressed in the flannels, then equipped with the dress, shoes and weights; the helmet is then attached with air hose connected, the pump started, and he is slowly lowered to the bottom.

"MORSE" IMPROVED SAFETY DIVING HELMETS



No. 1 Helmet—Has sectional screw, safety valve, regulating escape valve and recessed gasket seat. Receives air in the head-piece.

Price, with 3 lights (as shown).....\$125.00

Price, with 3 lights and top light.....137.50

The top light allows the diver to look upward without throwing the body back.

No. 2 Helmet—Is exactly the same as No. 1 except that it receives air in the breast plate instead of head-piece. Same prices as No. 1.

No. 3 Helmet—Has flanges and five swinging bolts, receives air in head.

Bolt pattern, 3 lights.....\$156.25

" " 4 " ".....168.75

Speaking Apparatus—Consisting of a rubber tube connected with a hearing and speaking disc inside the helmet, with a mouthpiece on other end for use of a helper.

Price, with 50 feet of speaking tube.....\$75.00

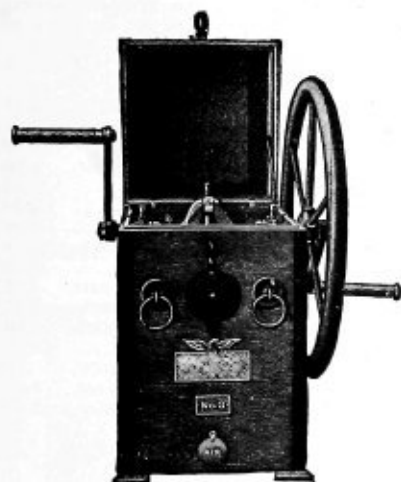
Electric Breast Lamp—Fitted with special lens and 16 candle-power incandescent lamp, also 125 feet of cable.

Price.....\$43.75

The above illustration shows No. 1, the most popular helmet in use. Fitted with 3 lights as shown and also with a top light.

Send for complete illustrated catalog giving complete Instructions for Diving

"MORSE" AIR PUMPS



Shows No. 3 Air Pump

Each pump is run by steam power, before shipping, to develop its capacity and test its efficiency.

AIR PUMP NO. 1

This is the U. S. government official standard pump. Has capacity for two divers working simultaneously down to 100 feet, or one diver only in very deep water. Pump has two cylinders, double action, with two patent indicating gauges to denote the air pressure and depth of each diver; with water cistern, two flywheels, in ash chest, with iron rings for lashing.

Price\$550.00

AIR PUMP NO. 1-A

U. S. navy standard for use on smaller ships. Will supply air for one diver to 100 feet depth.

Pump is single cylinder, double action, with patent indicating gauge to denote air pressure and depth of diver, water cistern, one flywheel, in ash chest, with iron rings for lashing.

Price\$330.00

AIR PUMP NO. 2

For deep-sea diving, pearl and sponge fishing, wrecking and general work. Will supply air for one diver in 125 feet of water.

Pump has three cylinders, open top, single action, with water cistern, patent indicating gauge, to denote air pressure and depth of diver, two flywheels, ash chest, polished brass corners, with iron rings for lashing. Price.....\$440.00

AIR PUMP NO. 3

For service in moderate depths, rivers, harbors, etc., for contractors, railroads, mines, etc. Will supply air for one diver in 95 feet of water. Pump has three cylinders, open top, single action, has gauge, one flywheel, two handles, ash chest, iron corners, with iron rings for lashing.

Price\$275.00

AIR PUMP NO. 4

For examinations, and all work of brief duration in shallow water. For waterworks, sewer department and contractors. Will supply air in 50 feet of water. Pump has single cylinder, double action, in ash chest.

Price\$137.50

AIR PUMP NO. 5

For shallow water and light service up to 40-foot depths. With folding brake mounted on plank, without case, two cylinders, single action.

Price\$85.00

AIR PUMP NO. 6

Designed for mule back transportation. Weight complete 270 lbs. Will supply air in 70 feet of water. Single cylinder, double action, water cistern, gauge, one flywheel, two handles, in ash chest.

Price\$218.75

AIR PUMP NO. 7

Specially designed for sponge and pearl fishing and all deep-sea operations requiring an extra powerful pump. Pump has extra large cylinders and special air valves. Will supply air in 200 feet of water. Pump has three cylinders, open top, single acting, water cistern, indicating gauge, two flywheels, two handles, ash chest with iron corners, iron rings and removable front.

Price\$550.00

AIR PUMP NO. 8

For fresh water pearlery and shell fishers working in water 15 to 20 feet deep. Single cylinder, double acting, no chest.

Price\$50.00

Send for catalog giving complete description

COMPLETE DIVING OUTFITS

A complete outfit consists of one air pump, one diving helmet (for prices see previous pages) and the list of articles given below. About the same list (see below) is sent for all numbers of outfits.

1 rubber diving dress (two furnished with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	\$40.00
100 feet air hose, with couplings (three pieces, 150 feet, with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per 50-foot length, 18.00
1 set diving weights, belt pattern.....	20.00
1 pair shoes, with lead or iron soles.....	12.00
1 pair patent diving mittens (two pairs with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per pair, 5.00
1 pair rings and clamps.....	5.00
1 life or signal line.....	2.50
1 pair cuff expanders.....	5.00
2 feet snap tubing (6 feet with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per foot, .50
1 pair chafing pants.....	2.50
1 pair divers' stockings (two pairs with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per pair, 1.25
1 woolen shirt and drawers (two pairs with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	each, 2.50
1 pair woolen mittens (two pairs with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per pair, 1.00
1 basket for helmet, dresses, hose, etc.....	15.00
3 bolts and nuts for helmet—spare—(six with Nos. 1, 1A, 2, 3, 6 and 7).....	each, .50
1 set extra couplings.....	per set, 3.00
$\frac{1}{2}$ yard rubber cloth for repairs (one yard with Outfits Nos. 1, 1A, 2, 3, 6 and 7).....	per yard, 2.00
1 can rubber cement for repairs (two pounds).....	.75
1 cutting punch.....	.75

No. 4 outfit, usually furnished with horseshoe style weights, price \$13.50.

No. 7 outfit is special, quoted upon request.

NET PRICE OF No. 3 OUTFIT

To show how the above prices are applied, we are giving below complete requirements for No. 3 outfit as an example. This outfit is very popular with contractors, railroads and mines. Complete in all respects for one diver.

1 No. 3 air pump.....	\$250.00	2 pairs divers' stockings.....	\$ 2.50
1 imp. diving helmet.....	100.00	2 woolen shirts and drawers.....	5.00
2 rubber diving dresses, at \$40.00.....	80.00	2 pairs woolen mittens.....	2.00
150 feet of air hose, coupled.....	54.00	1 basket for helmet, etc.....	15.00
1 set diving weights, belt pattern.....	20.00	6 extra bolts and nuts for helmet.....	3.00
1 pair diving shoes, iron soles.....	12.00	1 set extra couplings.....	3.00
2 pairs diving mittens.....	10.00	1 yard rubber repair cloth.....	2.00
1 pair rings and clamps.....	5.00	1 2-pound can rubber cement.....	.75
1 life or signal line.....	2.50	1 cutting punch.....	.75
1 pair cuff expanders.....	5.00		
6 feet of snap tubing, at 50c.....	3.00	Total	\$578.00
1 pair of chafing pants.....	2.50		

Approximate shipping weight, 900 pounds (43 cubic feet).

No. 8 COMPLETE DIVING OUTFIT

A simple serviceable outfit for fresh-water pearling, mills, breweries, gas companies, mines, chemical factories, sewer departments or for entering tanks or any confined noxious vapors. For depths of 15 to 20 feet.

Outfit consists of:

- 1 air pump, single cylinder, double acting, no chest.
- 1 helmet, single light, no breastplate.
- 1 dress (jacket and trousers).
- 3 feet snap tubing.
- 50 feet hose, with couplings.
- 1 pair iron sandals.
- 1 signal line.

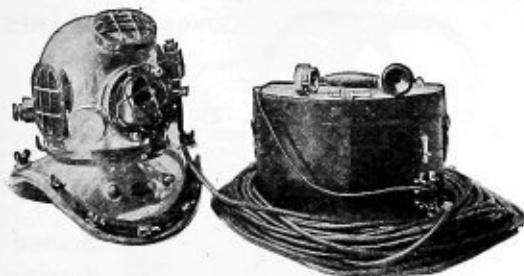
Weight, 200 pounds.

Price, net \$175.00

To prevent chafing of Dress we commend our Canvas Dress, to be worn outside, at \$5.50, or Canvas Overalls at \$2.50.

For work above water no Shoes are needed, the feet and legs of the Dress being in the form of Rubber Boots.





"MORSE" IMPROVED WATER-PROOF DIVING DRESSES



Fitted with vulcanized rubber collar and cuffs and reinforced at all parts exposed to wear. Very carefully made from the best material obtainable. Each dress has inside cape to pull up around the diver's neck.

SIZES:

No. 1. For Diver 5' 6"	No. 3. For Diver 5' 10"
No. 2. " 5' 8"	No. 4. " 6' to 6' 2"

Always give height of diver in ordering

Price.....net, \$44.00

Diving Dress, with collar for square-shaped breast plate. Price.....\$44.00

Canvas Dress, Overall, made of stout duck and to be worn over the diving dress to prevent chafing the dress. Price.....net, \$6.25



DIVING WEIGHTS Belt Pattern

A series of lead weights riveted to broad waist belt with two shoulder straps.

Price, per set...net, \$25.00

TELEPHONES FOR DIVERS

To make this style compact as possible, we place the battery in strong ash case, with space for receiver and transmitter when not in use.

Combines our latest improvements and is found most desirable for general service.

Complete with battery, 120 feet cable, receiver, and transmitter for attendant.

Receiver and transmitter for helmet...\$125.00

Price does not include helmet



MORSE PATENTED GRADUATING DIVING WEIGHTS

As each weight can be instantly removed, the diver can adjust the amount to any desired depth.

Lead weights in gun metal pockets, broad waist belt, and two shoulder straps.

Price, per set...net, \$30.00



DIVING WEIGHTS Strap Pattern

The small belts pass through the weights which can be removed as desired.

Price, per set...net, \$30.00

DIVING WEIGHTS Horseshoe Pattern



The old style weights but still have the approval of some divers.

Price, per set.....net, \$17.00

**DIVING SHOES****Lead Soles**

Heavy grain leather, lead soles secured with brass screws. This is the

popular shoe with all divers.

Price.....pair, net, \$15.00

**DIVING SHOES****Iron Soles and Toe Caps**

Heavy grain leather. The best for rough work.

Price.....pair, net, \$15.00

" with brass soles " " 20.00

**DIVING SHOES****Sandal Pattern**

With heavy rubber shoe.

Iron soles with toe caps.

Price.....pair, \$12.50

**CHAFING SHOES**

Made of canvas and rubber, useful to protect feet of diving dress from wear.

Price.....pair, net, \$5.00

DIVER'S KNIFE AND BELT

Heavy belt, with air hose holder, knife in brass case, screw joint.

Price.....\$10.00

IMPROVED URINALS

Rubber, with straps to secure to leg.

Price.....\$4.25

Brass Screw Urinal to insert in dress, enabling diver to urinate on the surface without removing the dress.

Price.....\$6.00

**RINGS AND CLAMPS****Polished Brass**

For securing rubber mittens to cuff of diving dress. Price.....pair, \$6.00

**RUBBER MITTENS**

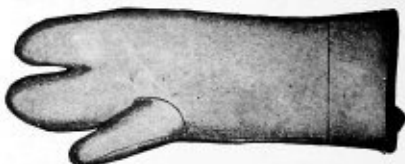
For protecting diver's hands on rough work or in very cold weather.

Price.....pair, net, \$6.00

RUBBER GLOVES

For work requiring the use of each finger.

Price.....\$6.00

TWO-FINGER RUBBER MITTENS

Price.....pair, \$7.50

**CUFF EXPANDERS**

For expanding the cuff of diving dress, that diver may withdraw his hand easily. Polished brass with wood handles.

Price.....pair, \$6.00

STANDARD AIR HOSE

White rubber, capped ends, 1/2 inch, 5 ply.

Price.....per foot, coupled, \$0.36

"per foot, not coupled, .30

FLOATING AIR HOSE

Black rubber, capped ends, 1/2 inch, 5 ply.

Price.....per foot, coupled, \$0.80

"per foot, without couplings, .74

AIR HOSE COUPLINGS

Gun Metal.....per set, \$3.00

Four Clamps......50

CRINOLINE

To be worn under dress in deep water. Heavy rattan, canvas covered, with shoulder straps.

Price.....\$8.50

HELMET CUSHION

To be worn under the dress for ease of diver's shoulders, breast and back. Canvas, filled with horsehair.

Each.....\$3.25

THE "VAJEN" HEAD PROTECTOR

For Use in Mines, Breweries, Fire Departments, Ice and Cold Storage Plants, Packers, Chemical Works, Etc.



The Protector is a helmet which completely covers the head and fits tightly around the shoulders where its weight rests. It is made by hand, of the best fire and waterproof materials, which render it proof against heat, fire, steam and all poisonous gases. Fresh air, always kept pure by the scientific treatment of the materials, is supplied to the wearer at the natural air pressure, from the metal reservoir attached to the back of the helmet. Weighs only 6 lbs. Can be put on in a few seconds.



Prices

The following prices include a double valve, fourteen-inch cylinder air pump, the necessary small tools, and a highly polished quartered oak box, or a glass front wall case.

Style "F" complete (capacity one hour), \$156.25

Style "G" complete (capacity two hours), 172.00

Style "H" complete (capacity three hours), 187.50

COVER'S PATENT RUBBER RESPIRATOR



The Respirator is designed for the use of persons who are exposed to the danger of inhaling poisonous dust fumes or gases.

A fine damp sponge is the best known filter for separating the impurities from the air and this in connection with the automatic valve insures perfect protection and ventilation. The sponge can be removed and rinsed in water to clean it and replaced again in one minute. The wearer will be readily convinced of the great value of the Respirator when he sees what the sponge has absorbed.

The Automatic Valve is so simple that it cannot get out of order and will always act, no difference what position the wearer assumes at his work.

The Respirator is made of the best white rubber, and is easily kept clean. It bends to fit any face perfectly and is fastened to the head with an adjustable elastic band.

COVER'S PATENT RUBBER GOGGLES



Protects the Eyes

Protects the Nose and Mouth

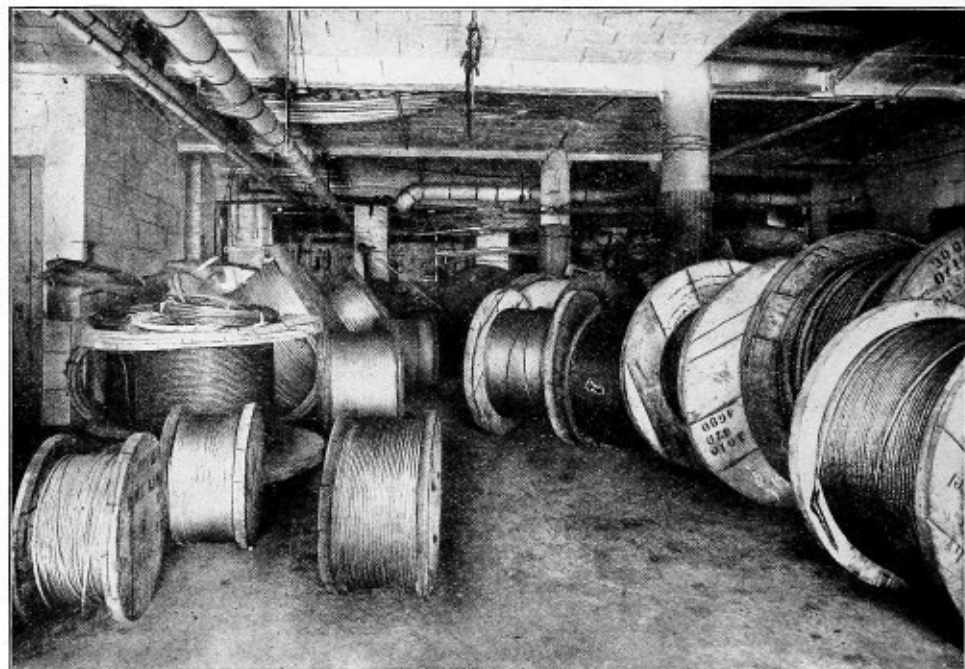
The Goggles fit well with the Respirator; they are made of a single piece of pure rubber and are indestructible. The lenses are clear glass and can be removed, cleaned and replaced in a moment. The cushion is a curved flange extending downwardly and outwardly from the lens portion. It has no filthy pads and is easily kept clean. Used largely by men in Foundries, Fire Departments, Chemical Works, Grinders and Polishers, etc. Fit anybody, **air tight**, but are furnished **ventilated** if desired. Should be **air tight** for use in irritating gases, lime, etc., but **ventilated** when used in most other places.

Cover's patent rubber respirators..... Each \$2.50
Cover's patent rubber goggles..... " 2.00

WIRE ROPE

We carry an immense stock in Chicago. All sizes and constructions in iron, crucible and plough steel, black and galvanized.

We make our own wire rope fittings or attachments.



A Section of Our Stock of Wire Rope

Besides the "Regular" or "Commercial" rope we have the following:

SPECIAL BRANDS**CHANNON "BULLOCK" PLOUGH STEEL WIRE ROPE**

The best and strongest rope THAT CAN BE MADE, and the most economical. Wire is drawn from the very finest English plough steel wire rods, which have for a base the purest genuine Swedish charcoal iron. Rods are tempered by special process and drawn with exceptional care by the most skilled workmen.

CHANNON "RELIANCE" ELEVATOR CABLE

Our special construction. Wires are drawn from the purest genuine Swedish charcoal iron rods and are tough, pliable and elastic. The best is none too good where human life is at stake.

"Bullock" Switch Ropes and Ballast Unloaders. Also Cable for Transmission, Haulage, Tram and Cable Ways, Steel Wire Strand, etc., etc., in fact

WIRE ROPE FOR ALL PURPOSES

STANDARD CONSTRUCTION CRUCIBLE CAST STEEL HOISTING ROPE

Composed of 6 Strands and a Hemp Center, Each Strand Having 19 Wires



This rope is applicable to a great variety of uses. It is particularly adapted for service in mines, for derricks, hay presses, cableways, cargo and coal hoists, conveyors, skip hoists and ballast unloaders.

The wire used in the construction of this rope is of the best quality of crucible cast steel, possessing double the strength of iron in the same diameter.

Furnished with wire core at an advance of 10 per cent over list below.

Diameter, Inches	List Price per Foot	Approx. Circum- Inches	Weight per Foot, Lbs.	Approx. Breaking Stress, Tons	Proper Working Load, Tons	Smallest Diam. of Drum or Sheave, Feet
2 3/4	\$2.10	8 3/8	11.95	228	45.6	11.
2 1/2	1.75	7 7/8	9.85	190	37.9	10.
2 1/4	1.42	7 1/8	8.00	156	31.2	9.
2	1.11	6 1/4	6.30	124	24.8	8.
1 3/4	.93	5 1/2	4.85	96	19.2	7.5
1 1/2	.74	5	4.15	84	16.8	6.
1 1/4	.66	4 3/4	3.55	72	14.4	5.5
1 3/8	.56	4 1/4	3.00	62	12.4	5.25
1 1/4	.46	4	2.45	50	10.0	5.
1 1/8	.38	3 1/2	2.00	42	8.40	4.5
1	.30	3	1.58	34	6.80	4.
7/8	.23	2 3/4	1.20	26	5.20	3.75
3/4	.18	2 1/4	0.89	19.4	3.88	3.5
5/8	.14	2	0.62	13.6	2.72	3.
1/2	.12	1 3/4	0.50	11.0	2.20	2.75
7/16	.11	1 1/2	0.39	8.8	1.76	2.
3/16	.10	1 1/4	0.30	6.8	1.36	1.75
5/16	.09 1/2	1 3/8	0.22	5.0	1.00	1.5
3/16	.09 1/4	1	0.15	3.4	0.68	1.
1/4	.09	3/4	0.10	2.4	0.48	.75

IRON HOISTING ROPE

Composed of 6 Strands and Hemp Center, Each Strand Having 19 Wires

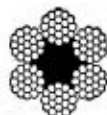
The wires in this rope being of the best quality of Swedish iron, are soft, tough and pliable. This rope is especially adapted for elevator service, and may also be used for general hoisting and running purposes where high tensile strength and resistance to abrasion are not essential. It is also used for transmission of power where pulleys are smaller than standard.

Furnished with wire core at an advance of 10 per cent above list.

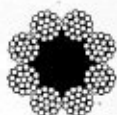
Diameter in Inches	List Price per Foot	Approximate Circumference in Inches	Weight per Foot in Lbs.	Approximate Breaking Stress in Tons	Proper Working Load in Tons	Minimum Diameter of Drum or Sheave in Feet
1 1/4	\$0.40	4	2.45	25	5.00	5.
1 1/8	.33	3 1/2	2.00	21	4.20	4.5
1	.26	3	1.58	17	3.40	4.
7/8	.20	2 3/4	1.20	13	2.60	3.75
3/4	.16	2 1/4	0.89	9.7	1.94	3.5
5/8	.12	2	0.62	6.8	1.36	3.
1/2	.10	1 3/4	0.50	5.5	1.10	2.75
7/16	.08	1 1/2	0.39	4.4	0.88	2.
3/16	.07 1/2	1 1/4	0.30	3.4	0.68	1.75
5/16	.07	1 3/8	0.22	2.5	0.50	1.5
3/16	.06 3/4	1	0.15	1.7	0.34	1.
1/4	.06 1/2	3/4	0.10	1.2	0.24	.75

"BULLOCK" WIRE ROPE

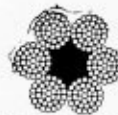
The Best and Cheapest Wire Rope That Can Be Used Where Greatest Strength is Needed or Where Hardest Service is Given.

CONSTRUCTIONS

"Standard" Construction
6 Strands of 19 Wires
Each Around One
Hemp Center.



"Extra Flexible"
8 Strands of 19 Wires
Each Around One
Hemp Center.



**Special Flexible Dredge
Rope, 6 Strands of 37
Wires Each Around
One Hemp Center.**

Especially adapted for heavy derricks used in structural steel and bridge erection, for railroad wrecking cars ballast unloaders, dredges, steam shovels, stump pullers, for rapid coal hoisting or wherever a rope is subjected to severest pulling strains or wear.

The wire is drawn from the very finest English plough steel wire rods. These rods have a base of the purest Swedish charcoal iron and are in every respect the finest possible material that can be procured at the present day. The rods are tempered by special process and drawn with exceptional care by the most skilled workmen. The highest tensile strength possible is obtained without sacrificing in the slightest degree, the toughness, pliability and elasticity.

STANDARD CONSTRUCTION—6 STRANDS OF 19 WIRES EACH

Diameter in inches	Price per Foot	Weight per Foot in pounds	Approx. Breaking Stress in Tons of 2,000 lbs.	Proper Working Load in Tons of 2,000 lbs.
$\frac{3}{8}$	\$0.14	.22	7	1.40
$\frac{1}{2}$	.16 $\frac{1}{2}$	.39	12 $\frac{1}{2}$	2.50
$\frac{5}{8}$	.22	.62	20	4.00
$\frac{3}{4}$	.30	.89	29	5.80
$\frac{7}{8}$	.36	1.20	36	7.20
1	.49	1.58	50	10.00
1 $\frac{1}{8}$	.57 $\frac{1}{2}$	2.00	60	12.00
1 $\frac{1}{4}$	.71 $\frac{1}{2}$	2.45	76	15.20
1 $\frac{3}{8}$	.89	3.00	95	19.00
1 $\frac{1}{2}$	1.09	3.55	113	22.60
1 $\frac{3}{4}$	1.66	4.85	157	31.40
2	1.81	6.30	191	38.20

EXTRA FLEXIBLE CONSTRUCTION—8 STRANDS OF 19 WIRES EACH

$\frac{3}{8}$	\$0.14	.18	4.60	.92
$\frac{1}{2}$	.16 $\frac{1}{2}$	.31	9.25	1.85
$\frac{5}{8}$	.22	.53	16.50	3.3
$\frac{3}{4}$	.30	.89	23.00	4.6
$\frac{7}{8}$	.36	1.05	28.50	5.7
1	.49	1.32	39.00	7.8
1 $\frac{1}{8}$	.57 $\frac{1}{2}$	1.82	54.	10.8
1 $\frac{1}{4}$	.71 $\frac{1}{2}$	2.13	67.	13.4
1 $\frac{3}{8}$	.89	2.51	82.	16.4
1 $\frac{1}{2}$	1.09	3.48	96.	19.2

SPECIAL FLEXIBLE DREDGE ROPE—6 STRANDS OF 37 WIRES EACH

$\frac{3}{8}$	\$13.75 per 100 ft.	.22	5.5	1.
$\frac{1}{2}$	15.40 "	.39	9.	1.75
$\frac{5}{8}$	20.90 "	.62	16.	3.
$\frac{3}{4}$	28.60 "	.89	22.	4.5
$\frac{7}{8}$	37.40 "	1.20	31.	6.
1	47.30 "	1.58	40.	8.
1 $\frac{1}{8}$	57.20 "	2.00	50.	10.
1 $\frac{1}{4}$	69.30 "	2.45	60.	12.
1 $\frac{3}{8}$	84.70 "	3.00	70.	14.
1 $\frac{1}{2}$	102.30 "	3.55	82.	16.

Larger Sizes Quoted Upon Request.

CHANNON "RELIANCE" ELEVATOR CABLES



OUR RELIANCE ELEVATOR CABLES

Are made of wires drawn from the purest Swedish Charcoal Iron rods. These wires are pliable and elastic, tough and strong.

The finished rope is the finest that can be made for elevator purposes, as the wire will wear without hardening and will not crack and stick out as do the wires in many ropes that have been in service but a short time.

The quality of wire used in our Reliance Elevator Cables and the construction of them has been the result of many years' experience.

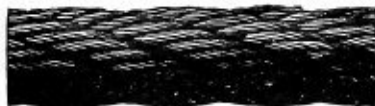
As the safety of human life is dependent upon the use of cables in elevators, the greatest care should be used in their selection.

Our Reliance Brand is of uniform strength and high quality.

Diameter in Inches	List Price Per Foot	Weight Per Foot, Lbs.	Approximate Breaking Strain in Tons of 2,000 Lbs.	Proper Size of Drum or Sheave, in Feet
$\frac{1}{4}$	\$0.06 $\frac{1}{2}$	.10	1.2	.75
$\frac{5}{16}$	.06 $\frac{1}{4}$	.15	1.7	1.
$\frac{3}{8}$	.07	.22	2.5	1.5
$\frac{7}{16}$	.07 $\frac{1}{2}$	.30	3.4	1.75
$\frac{1}{2}$	.08	.39	4.4	2.
$\frac{9}{16}$	.10	.50	5.5	2.75
$\frac{5}{8}$	.12	.62	6.8	3.
$\frac{3}{4}$	.16	.89	9.7	3.5
$\frac{7}{8}$	.20	1.20	13.	3.75
1	.26	1.58	17.	4.
1 $\frac{1}{8}$	.33	2.00	21.	4.5
1 $\frac{1}{4}$	.40	2.45	25.	5.

TILLER ROPE

Composed of six ropes laid around a hemp center; each rope has 6 strands and a hemp center, making 252 wires in all.



This is the most flexible rope made, but care should be taken not to subject it to severe strains or abrasive wear.

Used for steering rope on vessels and for hand ropes on elevators.

Diameter in inches	LIST PRICE PER FOOT		Circumference in inches	Weight per Foot in pounds
	Iron	Cast Steel		
$\frac{1}{4}$	\$0.07 $\frac{1}{2}$	\$0.11	$\frac{3}{4}$	.07
$\frac{5}{16}$	.08	.12 $\frac{1}{2}$	1	.11
$\frac{3}{8}$	.09	.14	1 $\frac{1}{8}$	.16
$\frac{7}{16}$	.10	.15	1 $\frac{1}{4}$	.21
$\frac{1}{2}$	.11	.17	1 $\frac{3}{8}$	.28
$\frac{9}{16}$	.14	.19	1 $\frac{1}{2}$	.35
$\frac{5}{8}$	.17	.24	2	.43
$\frac{3}{4}$	.22	.30	2 $\frac{1}{4}$	.62
$\frac{7}{8}$	.27	.36	2 $\frac{3}{4}$	.84
1	.33	.43	3	1.10

TILLER ROPE

English Construction



Composed of six ropes laid around a hemp center; each rope has twelve wires around a hemp center making seventy-two wires and seven hemp cores.

Circumference in inches	Approximate Diameter in inches	LIST PRICE PER FOOT		Weight per Foot in pounds
		Iron	Cast Steel	
1	$\frac{1}{2}$	\$0.05 $\frac{1}{2}$	\$0.07	.11
1 $\frac{1}{4}$	$\frac{3}{4}$	.06	.07 $\frac{1}{2}$	.....
1 $\frac{1}{2}$	$\frac{7}{8}$	.06 $\frac{1}{2}$	.08 $\frac{1}{2}$	.17
1 $\frac{3}{4}$	1	.07	.09	.24
2	1 $\frac{1}{8}$	.08	.10	.33
2 $\frac{1}{4}$	1 $\frac{1}{4}$	.09	.12	.43
2 $\frac{1}{2}$	1 $\frac{3}{8}$	.11 $\frac{1}{2}$	.15	.54
2 $\frac{3}{4}$	1 $\frac{1}{2}$	.14 $\frac{1}{2}$	.19	.67
3	1 $\frac{3}{4}$	.17	.23	.81
3 $\frac{1}{4}$	2	.20	.27	.97
	2 $\frac{1}{8}$	.22	.30	1.14

STANDARD PLOW STEEL HOISTING ROPE

Composed of 6 Strands and a Hemp Center, Each Strand Having 19 Wires



Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet	Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
2	\$1.56	6.30	165.	33.0	10.	3/4	\$0.26	0.89	25.	5.00	3.5
1 3/4	1.35	4.85	128.	25.6	9.	5/8	.19	0.62	18.	3.60	3.25
1 1/2	1.08	4.15	111.	22.2	8.	3/8	.16	0.50	14.5	2.90	2.75
1 1/4	.93	3.55	96.	19.2	7.	1/2	.14	0.39	11.4	2.28	2.5
1 1/8	.77	3.00	82.	16.4	6.	7/8	.13	0.30	8.85	1.77	2.25
1 1/4	.63	2.45	67.	13.4	5.5	1 1/8	.12 1/2	0.22	6.55	1.31	2.
1 1/8	.52	2.00	56.	11.2	5.	1 1/4	.12 1/4	0.15	4.50	0.90	1.75
1	.43	1.58	44.	8.80	4.5	1 1/2	.12	0.10	3.00	0.60	1.5
3/4	.34	1.20	34.	6.80	4.						

EXTRA STRONG CRUCIBLE CAST STEEL HOISTING ROPE

Composed of 6 Strands and a Hemp Center, Each Strand Having 19 Wires

This Rope is a grade intermediate between regular crucible and standard plow steel

Diameter in inches	List Price per foot	Weight per foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.	Proper Working Load in tons of 2,000 lbs.	Minimum Diameter of Drum or Sheave in ft.	Diameter in inches	List Price per foot	Weight per foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.	Proper Working Load in tons of 2,000 lbs.	Minimum Diameter of Drum or Sheave in ft.
1	\$0.36	1.58	39.	7.80	4.5	1 1/2	\$0.12 1/2	0.39	10.1	2.02	2.5
3/4	.28	1.20	30.	6.00	4.	1 1/4	.11 1/2	0.30	7.8	1.56	2.25
5/8	.22	0.89	22.	4.40	3.5	1 1/8	.11	0.22	5.78	1.15	2.
3/8	.16 1/2	0.62	15.8	3.16	3.25	1 1/4	.10 3/4	0.15	4.05	0.81	1.75
1/2	.14	0.50	12.7	2.54	2.75	1 1/2	.10 1/2	0.10	2.70	0.54	1.5

EXTRA FLEXIBLE HOISTING ROPE

Composed of 8 Strands and One Hemp Center, Each Strand Having 19 Wires



This rope has two more strands and smaller wires than the regular 6-strand rope and is especially adapted for running over comparatively small sheaves on derricks, coal handling machinery, cargo hoists, pile drivers, and for logging purposes.

On account of the somewhat larger hemp center, the strength is a trifle less than that of the regular 6-strand rope; but under many conditions where extreme pliability is required, this extra flexible rope, owing to its ability to withstand severe bending retains its strength longer than the stiffer 6-strand rope.

CRUCIBLE CAST STEEL

Diameter in inches	List Price per foot	Weight per foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.	Proper Working Load in tons of 2,000 lbs.	Minimum Diameter of Drum or Sheave in ft.	Diameter in inches	List Price per foot	Weight per foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.	Proper Working Load in tons of 2,000 lbs.	Minimum Diameter of Drum or Sheave in ft.
1 1/2	\$0.66	3.48	65	13.0	2.75	5/8	\$0.14	.53	11.6	2.32	1.50
1 1/4	.56	2.51	56	11.2	2.43	3/4	.12	.43	9.4	1.88	1.25
1 1/8	.46	2.13	45	9.0	2.50	1/2	.11	.31	6.6	1.32	1.00
1 1/4	.38	1.82	38	7.6	2.25	1/4	.10	.27	6.1	1.22	.88
1	.30	1.32	27	5.4	2.00	3/8	.09 1/2	.18	3.3	.66	.75
3/4	.23	1.05	21	4.2	1.83	1/2	.09 1/4	.12	2.2	.44	.50
3/8	.18	.89	16.5	3.3	1.75	1/4	.09	.066	1.6	.32	.38

TRANSMISSION OR HAULAGE ROPE

Composed of 6 Strands and Hemp Center, Each Strand Having 7 Wires



CRUCIBLE CAST STEEL

This construction is much stiffer than 6 x 19 used for hoisting.

This rope is for use in haulage systems and on inclined planes where subjected to considerable abrasive wear. For sand lines, deep oil-well drilling, this rope is used exclusively.

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
$\frac{5}{16}$	\$0.04½	0.15	3.4	0.68	2.
$\frac{3}{8}$	.05½	0.22	4.8	0.96	2.5
$\frac{7}{16}$	.06½	0.30	6.6	1.32	3.
$\frac{1}{2}$	.07½	0.39	8.4	1.68	3.5
$\frac{9}{16}$	.09	0.50	10.6	2.12	4.
$\frac{5}{8}$	.11	0.62	13.2	2.64	4.5
$\frac{3}{4}$	.16	0.89	18.6	3.72	6.
$\frac{7}{8}$	.22	1.20	24.	4.80	7.
1	.28	1.58	32.	6.40	8.

EXTRA STRONG CRUCIBLE CAST STEEL ROPE, WITH 7 WIRES TO STRAND

6 Strands and 1 Hemp Core

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
$\frac{3}{8}$	\$0.05½	0.22	4.8	0.96	2.5
$\frac{1}{2}$	.06½	0.30	6.6	1.32	3.
$\frac{5}{8}$	.07½	0.39	8.4	1.68	3.5
$\frac{3}{4}$	.09	0.50	10.6	2.12	4.
$\frac{7}{8}$	.11	0.62	13.2	2.64	4.5
$\frac{1}{2}$	.13½	0.75	15.8	3.16	5.
$\frac{3}{4}$	.16	0.89	18.6	3.72	6.
$\frac{7}{8}$	.22	1.20	24.	4.80	7.
1	.28	1.58	32.	6.40	8.

FLEXIBLE WIRE SASH CORD

Composed of 6 Strands and a Cotton Core, Each Strand Having 7 Wires



Diameter in inches	PRICE PER FOOT			APPROXIMATE BREAKING STRESS IN POUNDS		
	Iron Annealed or Bright	Tinned or Galvanized Iron	Copper	Bright Iron	Annealed Iron	Bright Copper
$\frac{1}{16}$	\$0.01¼	\$0.01¼	\$0.03	140	110	90
$\frac{1}{8}$	.01½	.02	.03½	320	250	200
$\frac{3}{16}$	.01¾	.02¼	.04½	550	425	350
$\frac{1}{4}$	.02¼	.03	.06	1,400	1,100	840
$\frac{5}{16}$	.02¾	.03½	.07½	1,800	1,400	1,080
$\frac{3}{8}$	.03	.04	.09	2,200	1,650	1,320

SWEDISH IRON ROPE

Composed of 6 Strands and a Hemp Center, Each Strand Having 7 Wires

This rope is used principally for transmission of power.

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
$\frac{3}{32}$	\$0.03¼	0.125	1.4	0.28	1.5
$\frac{1}{16}$	.03¾	0.15	1.7	0.34	2.
$\frac{3}{16}$	.04½	0.22	2.4	0.48	2.5
$\frac{1}{2}$	.05½	0.30	3.3	0.66	3.
$\frac{5}{16}$	.06½	0.39	4.2	0.84	3.5
$\frac{3}{8}$	.08	0.50	5.3	1.06	4.
$\frac{7}{16}$	.10	0.62	6.6	1.32	4.5
$\frac{1}{2}$	.12	0.75	7.9	1.58	5.
$\frac{3}{4}$	.14	0.89	9.3	1.86	6.
$\frac{7}{8}$	.17½	1.20	12.	2.40	7.
1	.23	1.58	16.	3.20	8.

GALVANIZED MAST-ARM OR ARC-LIGHT ROPE

Composed of 9 Strands and 1 Cotton Core, Each Strand Having 4 Wires

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in pounds
$\frac{1}{4}$	\$0.02¾	.082	1,450
$\frac{5}{16}$	.03½	.111	1,950
$\frac{3}{8}$	.05	.195	3,450

GALVANIZED WIRE ROPE

FOR DERRICK GUYS, SHIPS, RIGGING AND SIMILAR USES

Composed of 7, 12 or 19 Wires to the Strand, 6 Strands and 1 Hemp Core



GALVANIZED IRON ROPE

Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per Foot in lbs.	Approx. Breaking Strain in tons	Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per Foot in lbs.	Approx. Breaking Strain in tons
		5 Strands, 7 Wires Each	With 12 Wires to the Strand					With 7 Wires to the Strand	With 12 Wires to the Strand		
$\frac{3}{8}$	$\frac{1}{2}$	\$0.02	.....	0.040	0.36	$\frac{1}{8}$	$2\frac{1}{2}$	\$0.10	.....	1.00	9
$\frac{7}{32}$	$\frac{3}{8}$	.02 $\frac{1}{4}$	.....	0.063	0.56	$\frac{3}{8}$	$2\frac{3}{4}$	.12	.....	1.21	11
$\frac{1}{4}$	$\frac{3}{4}$	.02 $\frac{1}{2}$	.....	0.090	0.81	1	3	.14	\$0.15	1.44	13
$\frac{9}{32}$	$\frac{7}{8}$	.03	.....	0.123	1.1	$1\frac{1}{8}$	$3\frac{1}{4}$	.16	.17	1.70	15
		With 7 Wires to the Strand				$1\frac{1}{8}$	$3\frac{1}{2}$	.18	.19	1.95	18
$\frac{5}{16}$	1	\$0.03 $\frac{1}{2}$	.....	0.16	1.4	$1\frac{1}{8}$	$3\frac{3}{4}$	.21	.22	2.25	20
$\frac{3}{8}$	$1\frac{1}{8}$	.04	.....	0.20	1.8	$1\frac{1}{8}$	4	.24	.25	2.55	23
$\frac{1}{2}$	$1\frac{1}{4}$	.05	.....	0.25	2.3	$1\frac{1}{8}$	$4\frac{1}{4}$	.27	.29	2.90	26
$\frac{5}{8}$	$1\frac{1}{2}$	.06	.....	0.36	3.2	$1\frac{1}{8}$	$4\frac{3}{4}$	.31	.33	3.25	29
$\frac{3}{4}$	$1\frac{3}{4}$	.07	.....	0.49	4.4	$1\frac{1}{8}$	5	.35	.37	3.60	32
$\frac{7}{8}$	2	.08	.....	0.64	5.8	$1\frac{1}{8}$	$5\frac{1}{4}$	.38	.40	4.00	36
$\frac{1}{4}$	$2\frac{1}{4}$	.09	.....	0.81	7.3	$1\frac{1}{8}$	$5\frac{3}{4}$	.41	.43	4.40	40
						$1\frac{1}{8}$	6	.44	.46	4.85	44

GALVANIZED CRUCIBLE CAST STEEL WIRE ROPE

Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per Foot in lbs.	Approx. Breaking Stress in tons of 2,000 lbs.	Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per Foot in lbs.	Approx. Breaking Stress in tons of 2,000 lbs.
		With 7 Wires to the Strand	With 19 Wires to the Strand					With 7 Wires to the Strand	With 19 Wires to the Strand		
$\frac{3}{8}$	1	\$0.05	\$0.10	0.16	3.7	$\frac{1}{8}$	$2\frac{1}{2}$	\$0.21	\$0.23	1.00	22
$\frac{7}{32}$	$1\frac{1}{8}$	.06 $\frac{1}{4}$	.10 $\frac{1}{2}$	0.20	4.0	$\frac{3}{8}$	$2\frac{3}{4}$	.25	.26	1.21	26
$\frac{1}{4}$	$1\frac{1}{4}$	.07 $\frac{1}{2}$	.11	0.25	5.7	1	3	.31	.33	1.44	31
$\frac{5}{16}$	$1\frac{1}{2}$	.08	.11 $\frac{1}{2}$	0.30	6.8	$1\frac{1}{8}$	$3\frac{1}{4}$	.36	.38	1.70	36
$\frac{3}{8}$	$1\frac{3}{4}$	.08 $\frac{1}{2}$	.12	0.36	8.1	$1\frac{1}{8}$	$3\frac{1}{2}$	.40	.42	1.95	41
$\frac{7}{8}$	2	.10	.13 $\frac{1}{2}$	0.49	10.8	$1\frac{1}{8}$	$3\frac{3}{4}$	.44	.46	2.25	47
$\frac{1}{2}$	$2\frac{1}{4}$	.12	.16	0.64	14.0	$1\frac{1}{8}$	4	.48	.50	2.55	53
$\frac{3}{4}$		.18	.20	0.81	17.6						

Only the best grade of crucible cast steel is used in this rigging, combining great strength with light weight and small diameter.

The style with 7 wires to the strand is used exclusively for standing rigging on boats or for guys, while that with 19 wires to the strand, being more flexible, is used for hoisting purposes.

GALVANIZED STEEL WIRE STRAND

Seven Wires Twisted into a Single Strand



Used for guys on stacks, telegraph and telephone poles, for signal strand, for suspending trolley wire, and as messenger strand for telephone cables and similar purposes.

Diameter, inches	Approximate Weight per 1,000 Feet, lbs.	Approximate Strength in lbs.	List Prices per 100 ft.
$\frac{3}{32}$	20	400	\$0.80
$\frac{1}{8}$	32	500	1.00
$\frac{5}{32}$	55	900	1.15
$\frac{3}{16}$	75	1400	1.25
$\frac{1}{4}$	95	1800	1.50
$\frac{5}{16}$	125	2300	1.75
$\frac{3}{8}$	210	3800	2.25
$\frac{7}{16}$	295	5000	2.75
$\frac{1}{2}$	415	6500	3.75
$\frac{5}{8}$	510	8500	4.50
$\frac{3}{4}$	650	11000	5.75
$\frac{7}{8}$	800	14000	7.25

GALVANIZED IRON OR CAST STEEL RUNNING ROPE

Twelve Wires to the Strand. Six Strands—Seven Hemp Cores



Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per foot in pounds	APPROXIMATE BREAKING STRESS IN TONS OF 2,000 POUNDS		Approximate Diameter in inches	Circumference in inches	PRICE PER FOOT		Weight per foot in pounds	APPROXIMATE BREAKING STRESS IN TONS OF 2,000 POUNDS	
		Iron	Cast Steel		Iron	Cast Steel			Iron	Cast Steel		Iron	Cast Steel
3/4	2 1/4	\$0.11 1/2	\$0.15	0.54	6.13	12.3	5/16	1	\$0.05 1/2	\$0.07	0.11	1.14	2.28
1 1/8	2 3/4	.14 1/2	.19	0.67	7.20	14.4	3/8	1 1/4	.06	.07 1/2	.17	2.15	4.50
1 1/4	2 7/8	.17	.23	0.81	8.21	16.4	7/16	1 1/2	.06 1/2	.08 1/2	.21	2.78	5.56
1 1/2	3	.20	.27	0.97	10.7	21.5	1/2	1 3/4	.07	.09	.24	3.47	6.94
1 5/8	3 1/4	.22	.30	1.14	12.0	24.0	9/16	2	.08	.10	.33	4.29	8.58
							5/8		.09	.12	.43		

This rope is galvanized by a special process. It is designed especially for service where great flexibility is required and where exposure to moisture is frequent. Its weight is only about two-thirds that of ordinary hoisting or running rope of the same diameter.

GALVANIZED STEEL HAWSERS



TWELVE WIRES TO THE STRAND. SIX STRANDS—SEVEN HEMP CORES

THIRTY-SEVEN WIRES TO THE STRAND. SIX STRANDS—ONE HEMP CORE

Very Flexible

Approximate Diameter in inches	Circumference in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds	Circumference in inches of New Manila Hawser of Equal Strength	Approximate Diameter in inches	Circumference in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds Cast Steel	Approximate Breaking Stress in Tons of 2,000 pounds Plow Steel
1	3	\$0.21	0.97	21.5	8	1	3	\$0.37	1.44	32	40
1 1/8	3 1/2	.25	1.14	24	8 1/2	1 1/8	3 1/2	.48	1.95	44	55
1 1/4	3 3/4	.27	1.32	27	9 1/4	1 1/4	4	.60	2.55	57	72
1 1/2	3 7/8	.30	1.51	29	9 3/4	1 1/2	4 1/4	.65	2.90	63	81
1 3/4	4	.34	1.72	32	10	1 3/4	4 3/4	.77	3.60	77	99
1 5/8	4 1/4	.37	1.94	39	11	1 5/8	5	.84	4.00	85	109
1 7/8	4 1/2	.41	2.18	42	11 1/2	1 7/8	5 1/2	.88	4.85	102	131
1 3/4	4 3/4	.44	2.42	45	12	2	6 1/4	1.20	6.25	115	166
1 5/8	4 5/8	.48	2.70	53	12 1/2						
1 3/4	5	.53	2.96	57	13						
1 7/8	5 1/8	.56	3.25	61	13 1/2						

The great advantage of galvanized steel hawsers over manila or hemp hawsers is in the smaller cost, bulk and weight, for hawsers of equal strength.

Galvanized steel hawsers are made from the best grade of crucible cast steel, and are from three to four times stronger than manila or hemp hawsers of equal size.

GALVANIZED STEEL CABLES FOR SUSPENSION BRIDGES

Composed of Six Strands, with Wire Center

Price per foot	Diameter in inches	Approximate Circumference in inches	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds	Price per foot	Diameter in inches	Approximate Circumference in inches	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds
Upon Application	1 1/4	4	2.57	62	Upon Application	2 1/2	6 1/2	7.60	185
	1 1/2	4 1/4	3.10	75					
	1 3/4	4 3/4	3.70	90		2 3/4	7 1/4	8.52	208
	1 5/8	5	4.34	106		2 5/8	7 3/4	9.50	232
	1 3/4	5 1/2	5.10	124		2 7/8	7 7/8	10.5	256
	1 7/8	5 3/4	5.90	144		3	8 1/4	11.6	283
	2	6 1/4	6.73	164		3 1/8	8 3/8	12.7	310

The strengths given are for cables made from the best crucible steel of 170,000 lbs. tensile strength per square inch. Galvanized plow steel cable of 190,000 lbs. per square inch can be furnished. The steel entering into the manufacture of these cables is subjected to a careful and rigid test before use.

CHANNON LOCOMOTIVE SWITCH OR WRECKING ROPES



Our ropes are spliced and served with wire in the best possible manner. We have never known one of our ropes to pull out in the splice, which is generally conceded to be the weakest point. We make our own hooks, links and thimbles of proper design and strength, fully equal to rope used.

Prices below are for crucible steel single ropes, i. e., with hook and thimble in one end, and link and thimble in other end.

Length in Feet	List Price and Diameter in Inches						
	1½	1¾	1¼	1½	1	¾	¾
Breaking Strain, Tons	72	62	50	42	34	26	19
20 ft.	\$30.75	\$24.75	\$19.25	\$17.10	\$13.00	\$11.35	\$ 7.60
25 "	34.00	27.50	21.50	19.00	14.50	12.50	8.50
30 "	37.25	30.25	23.75	20.90	16.00	13.65	9.40
35 "	40.50	33.00	26.00	22.80	17.50	14.80	10.30
40 "	43.75	35.75	28.25	24.70	19.00	15.95	11.20
45 "	47.00	38.50	30.50	26.60	20.50	17.10	12.10
50 "	50.25	41.25	32.75	28.50	22.00	18.25	13.00

Prices quoted upon request, for ropes with two additional links.

Ask for prices on our "Bullock" plough steel wire switch, also ballast unloader ropes; they will out-pull and outwear any others made.

SOME WIRE ROPE ATTACHMENTS



Thimble Spliced and Served



Closed Socket Babbitted



Hook and Thimble



Open Socket, Babbitted

Prices of Fittings, including Splicing, quoted upon request



Cut Showing Method of Attaching Wire Rope Thimbles and Clips

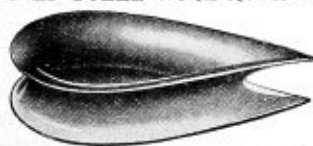
CHANNON
"UNION"
WIRE
ROPE
CLIPS
OR
CLAMPS



Cannot
Break
Cannot
Slip

Suitable for Wire Rope Diameter, inches	Price, Each Galvanized	Price, Each Black
1/4	\$0.30	\$0.25
3/8	.30	.25
1/2	.30	.25
5/8	.35	.30
3/4	.40	.35
7/8	.50	.40
1	.55	.45
1 1/8	.60	.50
1 1/4	.70	.60
1 1/2	.75	.65
1 3/4	.80	.70
1 7/8	.85	.75
2	4.00	3.50
2 1/4	4.40	4.00
2 1/2	5.50	5.00

GALVANIZED STEEL WIRE ROPE THIMBLES



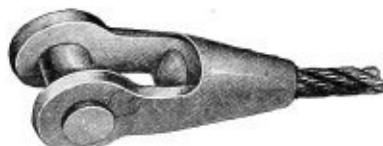
Suitable for Wire Rope, Diameter, inches	Price, per Dozen	Price, Each
1/4	\$ 0.84	\$0.08
3/8	.84	.08
1/2	.96	.10
5/8	1.08	.11
3/4	1.20	.12
7/8	1.32	.13
1	1.44	.14
1 1/8	1.56	.16
1 1/4	1.80	.18
1 1/2	1.92	.20
1 3/4	2.40	.25
1 7/8	3.00	.30
2	3.96	.40
2 1/4	5.04	.50
2 1/2	6.00	.60
2 3/4	7.80	.80
2 7/8	9.00	.90
3	11.40	1.15
3 1/4	13.20	1.30

DROP-FORGED WIRE ROPE SOCKETS



Closed Pattern

Suitable for Wire Rope, Diameter, inches	Extreme Length, inches	Price, Each
3/8	5 3/8	\$0.85
1/2	5 1/8	.85
5/8	6	1.10
3/4	6	1.10
7/8	6 1/2	1.35
1	8	1.65
1 1/8	9	1.85
1 1/4	10 3/8	2.40
1 1/2	10 3/8	3.30
1 3/4	11 3/4	4.50
1 7/8	11 3/4	6.00
2	14	6.80
2 1/4	.....	12.00
2 1/2	.....	13.00
2 3/4	.....	16.00
3	.....	21.00



Open Pattern

Suitable for Wire Rope, Diameter, inches	Extreme Length, inches	Price, Each
3/8	4 3/4	\$ 1.00
1/2	4 3/4	1.00
5/8	5 1/2	1.35
3/4	5 1/2	1.35
7/8	6 1/2	1.65
1	7 1/4	2.10
1 1/8	8 1/2	2.50
1 1/4	10	3.15
1 1/2	10	4.50
1 3/4	11 1/4	6.10
1 7/8	11 3/4	7.50
2	13 1/2	8.00
2 1/4	.....	13.00
2 1/2	.....	15.50
2 3/4	.....	16.50
3	.....	23.00

"CABELINE"**A Lubricant and Protector for Wire Rope**

Wire rope is often put into service and used severely without care or protection of any kind, and cases are not infrequent where ropes suddenly break while the outside wires show no sign of wear.

To get the full service from wire ropes, each wire, each strand, and the whole rope must be kept in perfect condition.

A Few Facts About Wire Rope

The condition of the outside wires of a rope does not show how much the inner ones are worn. Cabeline takes care of both internal and external lubrication. Acids in oils, greases and in the air make iron and steel brittle. Rust destroys quicker than hard work.

Oils or Grease Not Suitable

Cabeline is free from mineral acids, which are so destructive to iron and steel, and which is much in evidence in common oils and grease so often used to protect wire ropes.

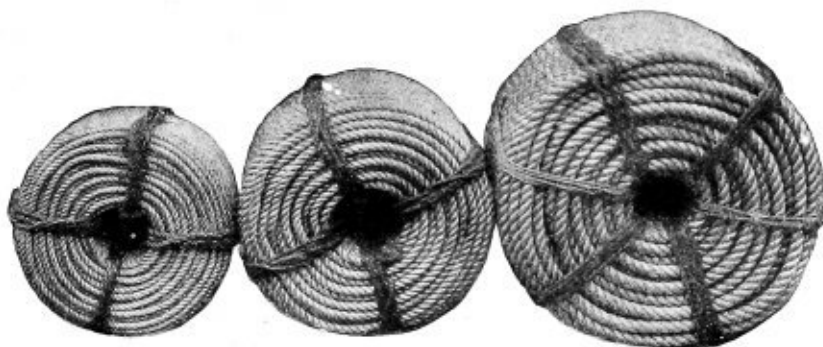
Method of Protection

Cabeline is applied while heated and in a liquid state, and so finds its way between the wires and penetrates the heart of the rope. It then solidifies, forming an adhering coating around each wire and around the finished rope, preventing internal friction and outside chafing against pulleys over which it runs.

Sizes and Prices

In 5 and 10 pound tin cans.....	Per pound, 40c
In 25, 40 and 75 pound wooden kits.....	" 35c
In half and full barrels.....	" 25c

MANILA ROPE



OUR STANDARD QUALITY MANILA ROPE

We guarantee our standard manila rope to be made of strictly pure Manila hemp and unadulterated with any inferior fibers. We carry all sizes of three-strand rope, from 3-16 to 4 inches diameter and all sizes of four-strand from $\frac{1}{2}$ to 3 inches in diameter. Larger sizes from our mill. Our coils are 500, 1,000 and 1,200 feet, from which we can cut any shorter lengths.

TALLOW LAID MANILA ROPE

Made of three or four strands and laid up in refined tallow. We carry all sizes, from $\frac{3}{8}$ to $2\frac{1}{2}$ inches diameter in stock.

"CHAMPION" HAWSER LAID MANILA DRILLING CABLE (see following pages).

We carry in stock 1,000 and 1,500 foot coils all sizes, from $\frac{3}{4}$ to $2\frac{1}{2}$ inches in diameter.

We can furnish any size or length from our mill.

OUR "AJAX" TRANSMISSION AND HOISTING ROPE (see following pages).

is made of the very finest selected stock of Cebue manila hemp, with all the knots and tow carefully combed out before it is spun into yarns.

We carry all sizes in stock in three or four strands, from $\frac{1}{2}$ to 3 inches in diameter in 1,200, 2,000 and 3,000 foot lengths from which shorter pieces can be cut. Extra large sizes or lengths we can furnish from our mill.

OUR "NUBIAN" BRAND OF TRANSMISSION AND COAL HOISTING ROPE

This is our "Ajax" rope laid up in a special plumbago lubricant. Carried in stock in sizes $\frac{3}{8}$ to 2 inches diameter, in 1,200 foot coils.

Basis on manila rope is for $1\frac{1}{4}$ -inch circumference ($\frac{7}{8}$ -inch diameter) and larger sizes.

Unless otherwise stated, all quotations are basis prices for full coils, subject to the following variations:

All sizes above $\frac{3}{8}$ -inch diameter	Basis
12-thread or $\frac{3}{4}$ -inch diameter	extra, $\frac{1}{2}$ c per lb.
6 and 9 thread or $\frac{1}{2}$ and 5-16-inch diameter	extra, 1c per lb.
Fine 6-thread or 3-16-inch diameter	extra, $1\frac{1}{2}$ c per lb.
3-thread laid or 3-16-inch diameter	extra, 1c per lb.
Tallow laid	extra, $\frac{1}{2}$ c per lb.
Hawser laid	extra, 1c per lb.

SISAL ROPE

* Carried in stock in full coils of 1,000 feet, and in one-half coils of 600 feet, in sizes from 3-16 to 1 inch.

All sizes above $\frac{3}{8}$ -inch diameter	Basis
12-thread or $\frac{3}{4}$ -inch diameter	extra, $\frac{1}{2}$ c per lb.
6 and 9 thread or $\frac{1}{2}$ and 5-16 inch diameter	extra, 1c per lb.
Fine 6 thread or 3-16-inch diameter	extra, $1\frac{1}{2}$ c per lb.

JUTE ROPE

All sizes carried in stock up to 1 inch diameter, put up in 1,000 foot coils.

$\frac{1}{2}$ -inch and larger	per lb., Basis
$\frac{3}{4}$ -16-inch diameter	extra, per lb. $\frac{1}{2}$ c

GENUINE IMPORTED RUSSIAN BOLT ROPE
TARRED HEMP ROPE

LAMBETH COTTON TRANSMISSION ROPE
RELIANCE COTTON TRANSMISSION ROPE

"CHAMPION" HAWSER LAID MANILA DRILLING CABLE

LOOK FOR THE RED YARN IN THE STRANDS



The use of manila rope for well drilling purposes has been increasing so rapidly in the past few years that at the present time the sale of rope for this purpose is enormous. It is very important that this rope should be made well and of good hemp. Poor rope is not cheap at any price.

Having had a great deal of experience in the line of well drilling machinery and in handling rope, we know just what is wanted, and are making a special rope for this purpose, which we call our **Champion Hawser Laid Manila Drilling Cable**, and in order to distinguish it from other ropes, we have a red yarn put in each of the strands as a trademark.

We carry Champion Hawser Laid Rope in stock in coils of 1,000 feet each, in the following sizes: $\frac{3}{4}$ inch, 1 inch, $1\frac{1}{8}$ inch, $1\frac{3}{8}$ inch, $1\frac{1}{2}$ inch, $1\frac{3}{4}$ inch, $1\frac{7}{8}$ inch, 2 inch, $2\frac{1}{4}$ inch, and $2\frac{1}{2}$ inch, and can cut from these coils any shorter lengths desired.

When ordering hawser laid rope, see that you get the Champion Rope with the red yarns in the strand. It will wear longer and give better satisfaction than other ropes.

WIRE OIL WELL LINES

SAND LINES

Composed of 6 strands around a hemp core, each strand having 7 wires.

Diam., inches	List, per Foot	Weight per Foot, lbs.	Approx. Tensile Strength, Tons
$\frac{3}{8}$	\$0.05 $\frac{1}{2}$	.22	4.8
$\frac{7}{16}$	.06 $\frac{1}{2}$	.30	6.6
$\frac{1}{2}$	.07 $\frac{1}{2}$	.39	8.4
$\frac{9}{16}$	.09	.50	10.6
$\frac{5}{8}$	.11	.62	13.2

CASING, TUBING AND DEAD LINES

Composed of 6 strands around a hemp core, each strand having 19 wires.

Diam., inches	List, per foot	Weight per Foot, lbs.	Approx. Tensile Strength, Tons
$\frac{1}{2}$	\$0.11	\$0.39	8.8
$\frac{5}{8}$	.12	.50	11.
$\frac{3}{4}$	.14	.62	13.6
$\frac{7}{8}$	.18	.89	19.4
$\frac{1}{2}$	.23	1.20	26.
1	.30	1.58	34.
$1\frac{1}{8}$	.38	2.00	42.
$1\frac{1}{4}$	.46	2.45	50.

"AJAX" ROPE HAS GREAT STRENGTH

Where great strength is required, where safety is a factor, where economy is considered, there our Ajax Rope should be used

**MATERIAL**

From the entire importations of manila hemp brought into our country each year only a very small percentage is of the strength and quality necessary for fine transmission rope, and of the original bales of this fine hemp almost one-half has to be separated and combed out before the long, clear, fine white hemp is ready to be twisted into Ajax Rope.

LUBRICANT

The lubricant which is used in the manufacture of this rope is carefully prepared, and while it does not blacken and smear up everything with which it comes in contact, for lasting and lubricating qualities it has no superior.

WORKMANSHIP

Only the oldest and most experienced labor is used in the manufacture of this rope, and the thorough, rigid inspection each length is subjected to insures as high a perfection as can be attained.

RECORD

A numbered tag is attached to each coil, with the request to send us the number at once if the rope is not received in perfect condition. This enables us at all times to trace the trouble, should there be any, and gives us an exact record of where each coil is in use, and when made.

Ajax Transmission Rope

Send for our Booklet on "Rope Transmission"

Ajax Hoisting Rope
Ajax Car Pulling Rope

Ajax Wrecking Rope
Ajax Pile Driving Rope

CONSIDERATION

To those of our customers and friends who now have transmission ropes running, or who contemplate installing rope for the transmission of power, we respectfully claim consideration for our Ajax Transmission Rope. We invite correspondence regarding any phase of the subject of power transmission, and any part of our experience and study will be cheerfully given.



View in preparing room showing the long, selected Cebu Manila hemp fibre from which Ajax rope is made. The bale on the lower right shows the original package as received from the Philippines.

A COIL OF AJAX ROPE READY FOR SHIPMENT

Showing how every part of the rope is carefully covered by heavy burlap, protecting the rope from chafing in transportation and keeping the rope clean.



APPROXIMATE WEIGHT OF AJAX ROPE

Diameter in inches	Circumference in inches	Weight per 100 feet, pounds	Diameter in inches	Circumference in inches	Weight per 100 feet, pounds
1/2	1 1/2	9	2	6 1/4	125
5/8	2	15	2 1/4	7	170
3/4	2 1/4	17	2 1/2	7 1/2	200
7/8	2 1/2	27	2 3/4	8 1/2	240
1	3	33	3	9 1/2	300
1 1/8	3 1/2	43	3 1/2	11	400
1 1/4	3 3/4	50	4	12 1/2	500
1 1/2	4 1/4	65	4 1/2	14	650
1 3/4	4 3/4	72	5	16	800
1 7/8	5 1/2	100	....	....	....

APPROXIMATE WEIGHT AND STRENGTH MANILA ROPE

Our "Ajax" Rope is 50 to 75 Per Cent Stronger than Standard Quality Manila Rope

Diameter, inches	Circumference, inches	Number of Feet in pound	Government Tests Strength New Rope, lbs.	Diameter inches	Circumference, inches	Number of Feet in pound	Government Tests Strength New Rope, lbs.
1/4	3/4	50 ft.	450	1 1/4	3 1/4	2 ft. 1 in.	11,020
5/8	1 1/8	33 "	780	1 1/2	4 1/4	1 " 8 "	14,156
3/4	1 1/4	25 "	1,000	1 3/4	4 1/2	1 " 5 "	15,870
7/8	1 1/2	19 "	1,280	1 7/8	4 3/4	1 " 4 "	17,680
1	1 3/4	11 "	1,760	2	5 1/4	1 " 1 "	21,600
1 1/8	2	9 "	2,400	2 1/4	6	9 1/2 "	28,210
1 1/4	2 1/4	7 "	3,140	2 1/2	7	7 "	38,400
1 1/2	2 3/4	6 "	3,970	3	7 1/2	6 1/2 "	44,080
1 3/4	3	5 "	4,900	3 1/2	9	4 1/2 "	63,480
1 7/8	3 1/2	3 " 6 in.	7,050	....	....	3 1/2 "	78,370
2	4	2 " 4 "	9,600	....	....	....	....

Tarred cordage about 25 per cent heavier than manila and of same strength.

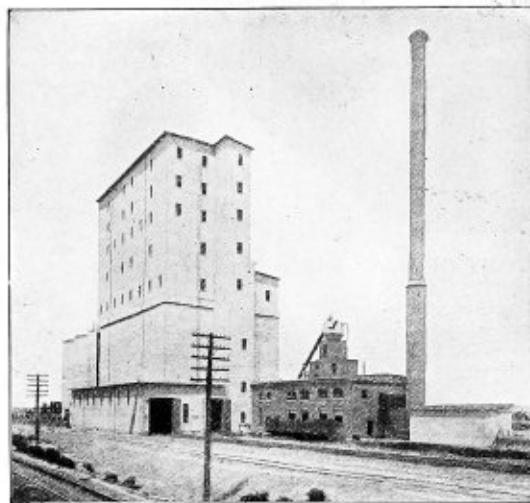
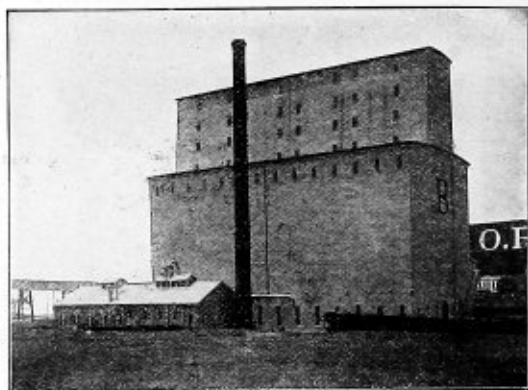
All our rope overruns the government requirements for strength.

Hawser laid rope will weigh one-sixth more. Sisal rope weighs about the same as manila rope, but has about 35 per cent less strength.

**Some of the Largest Elevators
in the Country Entirely
Equipped with "Ajax"
Transmission
Rope**

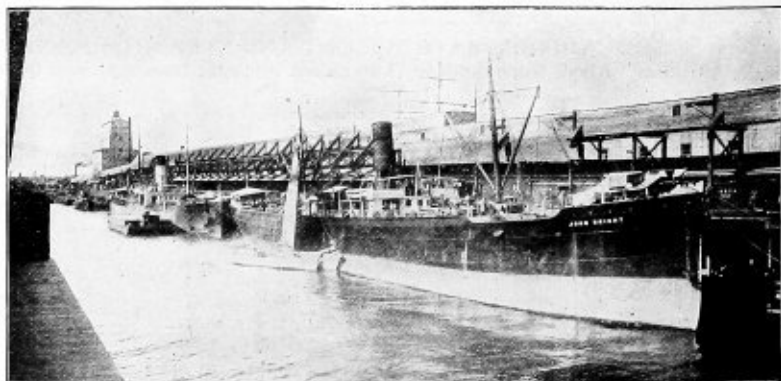
**Chesapeake and Ohio Railroad Co.'s
Elevator "B"**

Newport News, Virginia



**New Missouri Pacific Railroad Co.'s
Elevator at Kansas City,
Missouri**

**The Louisville and
Nashville Railroad
Co.'s Elevator, Pen-
sacola, Fla., contain-
ing the longest Rope
drive in the world.**



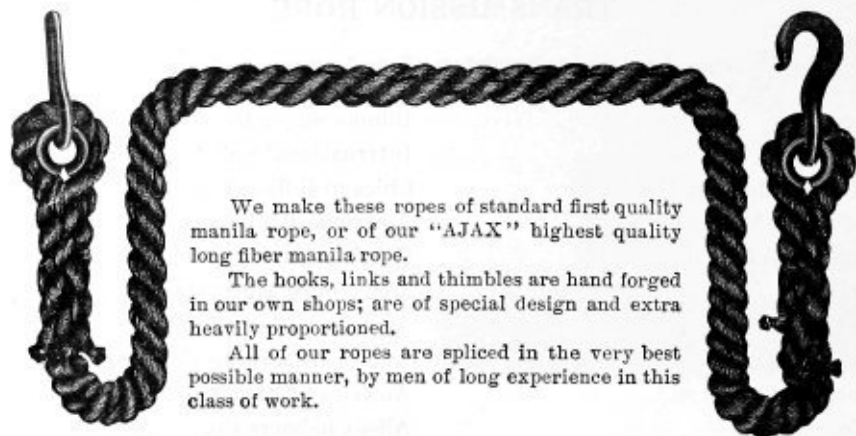
The new immense Illinois Central Elevator "E" at Stuyvesant Docks, New Orleans, La., is entirely equipped (1905) with "Ajax" Transmission Rope.

**A FEW WELL-KNOWN COMPANIES USING AJAX
TRANSMISSION ROPE****Send for our Booklet on "Rope Transmission"**

Illinois Steel Co.	Illinois Sugar Refining Co.
Ashland Steel Co.	International Salt Co.
Republic Iron & Steel Co.	Chicago Edison Co.
American Steel & Wire Co.	American Bridge Co.
Dillon-Griswold Wire Co.	Deering Harvester Plant.
Inland Steel Co.	McCormick Harvester Co.
Armour & Co.	American Linseed Oil Co.
Cudahy Packing Co.	American Malting Co.
Omaha Packing Co.	American Cereal Co.
Swift & Co.	Allis-Chalmers Co.
Nelson Morris & Co.	City of Chicago.
Hammond Co.	American Cutlery Co.
Schwarzschild & Sulsberger.	Bates Machine Co.
Continental Packing Co.	Cincinnati Edison Electric Co.
Heath & Milligan Mfg. Co.	Y. & L. Coal Co.
Chicago Union Traction Co.	Ogdensburg Trans. Co.
Northwestern Elevated R. R. Co.	Plano Mfg. Co.
Griffin Wheel Co.	Union Steamboat Co.
Bost & Mont. Con. C. & S. Mng. Co.	Calumet Elevator Co.
Butte Reduction Works.	Santa Fe Elevator Co.
Canadian Smelting Co.	Export Elevator Co.
Colorado Smelting & Mining Co.	W. A. Clark.
Parrott Silver & Copper Mining Co.	Northern Mining Co.
Anaconda Copper Mining Co.	Minnesota Iron Co.
Montana Ore Purch. Co.	Great Western Cereal Co.
Kimberly & Clark Co.	Minn. Gen'l Elect. Co.
Diamond Paper Co.	Lehigh Valley Coal Co.
Shattuck & Babcock Co.	Northern Steamship Co.
St. Louis Portland Cement Co.	Rosenbaum Grain Co.
Washburn-Crosby Co.	Westinghouse C. K. Co.
Pillsbury-Washburn Flour Mills Co.	Stillwell-B. & S.-V. Co.
German-American P. Cement Co.	American Hide & Leather Co.
Illinois Malleable Iron Co.	

Investigate the Merits of "AJAX"**It has no equal**

MANILA RAILROAD SWITCH AND WRECKING ROPES



We make these ropes of standard first quality manila rope, or of our "AJAX" highest quality long fiber manila rope.

The hooks, links and thimbles are hand forged in our own shops; are of special design and extra heavily proportioned.

All of our ropes are spliced in the very best possible manner, by men of long experience in this class of work.

Our "AJAX" ropes are absolutely the strongest, safest and most economical ropes made. They will outpull all others.

Usual Lengths in Feet	Diameter of Rope Used	Price of "Ajax" Highest Quality Ropes	Price of Standard Manila Ropes
30 to 50	2½ inches	\$.....	\$.....
30 " 50	3 "	.....	.....
30 " 50	3½ "	.....	.....
30 " 50	4 "	.....	.....
30 " 50	5 "	.....	.....

We make Switch Ropes of any length and diameter

"MAGNOLIA" ROPE DRESSING

For Manila Transmission Ropes



It is the only dressing made that penetrates to the center of a transmission rope, thoroughly lubricating the fiber there, besides protecting the outside of the rope. Money spent in caring for and protecting your transmission rope is money saved.

Transmission ropes are at all times subject to many conditions which tend to hard wear and short life; internal wear, caused by the chafing of the fibers, and external wear, caused by contact with the pulleys, soon takes the life and strength out of a rope. Rapidly moving ropes are in an ever-changing circulation of air,

which, together with the continual bending open of the strands, causes rapid evaporation of any lubricant with which the rope may have been originally treated. Manila fiber, which is naturally tough and strong, is, when dry, rough and harsh, but, when treated with a perfect lubricant, becomes smooth and silky.

The following quotation from a professor of mechanical engineering who has made careful, actual tests may be of interest. He says: "A manila rope with the fiber properly lubricated, will, under the same conditions, outlast from two to four similar dry ropes."

In 5 and 10 pound tin cans	Per pound, 40c
In 25, 40 and 75 pound wooden kits	" 35c
In half and full barrels	" 25c

ROUND STEEL OPEN CUT THIMBLES

For Manila Rope



Size, inches	Galv., Price Each	Galv., Price Per Dozen	Black, Price Each	Black, Price Per Dozen
3/4	\$0.03	\$0.28	\$0.02 1/2	\$0.24
7/8	.03	.28	.02 1/2	.24
1	.03	.28	.02 1/2	.24
1 1/8	.03	.30	.03	.26
1 1/4	.03	.32	.03	.28
1 3/8	.04	.34	.03	.30
1 1/2	.04	.36	.03 1/2	.32
1 3/4	.05	.45	.04	.35
2	.06	.60	.05	.50
2 1/4	.09	.90	.07	.70
2 1/2	.11	1.10	.08	.80
2 3/4	.14	1.40	.10	1.00
3	.16	1.60	.12 1/2	1.25

Larger sizes, 3 1/4 to 7 1/2 inches, galvanized, per lb. \$0.20
 " " 3 1/4 to 7 1/2 " plain, " " .16

Measure Diameter out side from edge to edge

GALVANIZED SOLID ROUND THIMBLES

For Manila Rope



Light Pattern

Size, inches	Price Each	Price Per Dozen
3/4	\$0.02 1/2	\$0.25
1	.03 1/2	.35
1 1/8	.04	.40
1 1/2	.04 1/2	.45
1 3/4	.05 1/2	.55

Heavy Pattern

Size, inches	Price Each	Price Per Dozen	Size, inches	Price Each	Price Per Dozen
2	\$0.07	\$0.70	3 1/2	\$0.22	\$2.15
2 1/4	.08 1/2	.85	4	.33	3.25
2 1/2	.12 1/2	1.25	4 1/2	.43	4.30
3	.17	1.70	5	.63	6.30

SWIVEL HOOKS

Wrought Iron, Black



Furnished with thimbles for either wire or Manila Rope.

Size, inches	Price Each	Price black, Per Dozen	Price Galv., Each	Price Galv., Per Dozen
1/2	\$0.30	\$3.00	\$0.35	\$3.50
3/4	.33	3.25	.38	3.75
1	.35	3.50	.40	4.00
1 1/8	.53	5.25	.60	6.00
1 1/4	.80	8.00	.90	9.00

Sizes 1 to 1 1/2 inch Black, lb. \$0.20
 " " " " Galv. " .20

SINGLE HOOKS

Wrought Iron, Black



With Manila Rope Thimble



With Wire Rope Thimble

Size, inches	Length of Hook, inches	Estim. Weight per 100 lbs.	Price black, Each	Price black, Per Dozen	Price Galv., Each	Price Galv., Per Dozen
3/4	2 1/4	15	\$0.21	\$2.10	\$0.23	\$2.25
1/2	3 1/4	37	.24	2.40	.26	2.60
5/8	4	67	.30	3.00	.33	3.25
3/4	4 7/8	100	.38	3.75	.42	4.25
7/8	5 3/8	150	.48	4.75	.53	5.25

Sizes 1 inch and larger, Black, lb. \$.18
 " " " " Galv. " .22

MATCH OR SISTER HOOKS AND THIMBLES

Wrought Iron Black



With Wire Rope Thimbles



With Manila Rope Thimbles

Size, inches	Length of Hook, inches	Estim. Weight per 100 lbs.	Price black, Each	Price black, Per Dozen	Price Galv., Each	Price Galv., Per Dozen
1/4	2 1/4	8	\$0.29	\$2.90	\$0.30	\$3.00
3/8	2 1/2	13	.29	2.90	.30	3.00
1/2	2 3/4	22	.29	2.90	.30	3.00
5/8	3 1/8	36	.32	3.15	.32	3.25
3/4	3 3/8	50	.32	3.20	.33	3.35
7/8	3 3/4	66	.34	3.35	.35	3.50
1	4 1/8	82	.40	4.00	.43	4.25
1 1/8	4 3/8	142	.48	4.75	.53	5.25
1 1/4	5 1/8	200	.68	6.75	.73	7.25

Size 1 inch and over Black, lb. \$0.20
 " " " " Galv. " .25

ESTIMATED STRENGTH OF BLOCKS FOR MANILA ROPE

Regular or Light Pattern, Wood Shell

Size of Block, Inches	Size of Rope Diameter, Inches	Two SINGLE BLOCKS		Two DOUBLE BLOCKS		Two TRIPLE BLOCKS	
		Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.
3	$\frac{5}{16}$	1,230	1,400	1,492	2,800	2,620	4,200
4	$\frac{1}{2}$	2,620	3,600	3,810	7,200	5,710	10,800
5	$\frac{3}{4}$	3,810	6,400	5,710	12,800	9,100	18,200
6	$\frac{7}{8}$	5,710	8,100	9,100	16,200	6,810	24,300
7	$\frac{1}{2}$	9,100	12,100	6,810	24,200	9,356	36,300
8	1	6,810	14,400	9,356	28,800	13,720	43,200
9	1	9,356	14,400	13,720	28,800	16,030	43,200
10	$1\frac{1}{8}$	13,720	19,600	16,030	39,200	18,722	58,800
12	$1\frac{1}{4}$	16,030	22,500	18,722	45,000	20,375	67,500

Heavy or Thick Mortise, Wood Shell

Size of Block, Inches	Size of Rope Diameter, Inches	Two SINGLE BLOCKS		Two DOUBLE BLOCKS		Two TRIPLE BLOCKS	
		Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Hooks in Lbs.	Breaking Strain of New Rope in Lbs.
8	$1\frac{1}{8}$	9,356	19,600	13,720	39,200	16,030	58,800
10	$1\frac{1}{4}$	16,030	22,500	19,050	45,000	19,050	67,500
12	$1\frac{1}{2}$	19,050	32,400	20,375	64,800	28,300	97,200
14	$1\frac{3}{4}$	28,300	43,300	35,680	86,600	35,680	129,900
16	2	35,680	48,400	72,100	96,800	72,100	145,200

"Bullock" Wrecking Blocks, with Lashing Shackles

Size of Block, Inches	Size of Rope Diameter, Inches	Two SINGLE BLOCKS		Two DOUBLE BLOCKS		Two TRIPLE BLOCKS	
		Breaking Strain of Shackles in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Shackles in Lbs.	Breaking Strain of New Rope in Lbs.	Breaking Strain of Shackles in Lbs.	Breaking Strain of New Rope in Lbs.
18	$2\frac{1}{4}$	116,300	67,600	132,532	135,200	155,542	202,800
20	$2\frac{1}{2}$	132,532	78,400	155,542	156,800	172,400	235,200
22	3	155,542	115,600	172,400	231,200	235,620	346,800
24	$3\frac{1}{2}$	172,400	192,000	235,620	384,000	265,995	576,000

One-third the strength of new rope is considered proper working load, but on large rope for extra heavy continuous duty four or five should be figured.

What one man should hoist with a pair of Blocks pulling hand over hand

With a rope over a stationary sheave, one man will hoist nearly half his weight, averaging 75 lbs., barring friction. Friction reduces this force to about 60 lbs. if the sheave be self-lubricating bronze bushed, and to about 50 lbs. if the sheave be common or iron bushed. Each sheave in the lower or movable block multiplies this force by two, so that one man should hoist with a pair of blocks as follows:

Single iron bushed.....	100 lbs.	Single S. L. bronze bushed.....	120 lbs.
Double " ".....	200 "	Double " ".....	240 "
Triple " ".....	300 "	Triple " ".....	360 "

We would call your attention to the fact that it takes three men to hoist with a pair of single blocks the same load one man will hoist with a pair of triple blocks.

MAXIMUM WORKING LOAD FOR TWO DOUBLE BLOCKS AND NEW MANILA ROPE

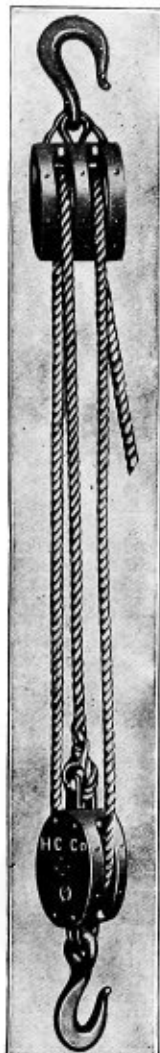
Regular or Light Pattern, Wood Shell

Size of blocks.....	5	6	7	8	9	10	12
Load, lbs.....	250	350	600	1,200	2,000	4,000	10,000

Heavy or Thick Mortise, Wood Shell

Size of blocks.....	8	10	12	14	16
Load, lbs.....	2,000	6,000	12,000	24,000	36,000

A set of double and triple blocks will hoist considerably more, and a single and double will hoist correspondingly less. The above estimate load is close to the danger line, and it is well to figure on using somewhat heavier blocks and rope, especially on the larger sizes.



Single and Double Block Tackle

LIGHT PATTERN WOOD SHELL BLOCKS FOR MANILA ROPE

Regular Inside Iron Strapped Blocks
With Loose Hooks

Fig. 101



Fig. 102



Fig. 103

Cuts show blocks with becket.

Order All Blocks by Length of Shell
Blocks with Common Iron Bushed Sheaves

Length of Shell, Inches	For Diameter Rope, Inches	SIZE OF SHEAVES			Single, Each	Double, Each	Triple, Each
		Diam., Inches	Width, Inches	Diameter of Pin, Inches			
3	$\frac{5}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	\$0.70	\$1.30	\$1.75
4	$\frac{3}{4}$	2 $\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	.85	1.60	2.15
5	$\frac{5}{8}$	3	$\frac{3}{4}$	$\frac{5}{8}$	.90	1.75	2.25
6	$\frac{3}{4}$	3 $\frac{1}{2}$	1	$\frac{1}{2}$	1.10	2.00	2.90
7	$\frac{3}{4}$	4 $\frac{1}{4}$	1	$\frac{5}{8}$	1.30	2.40	3.50
8	1	4 $\frac{3}{4}$	1 $\frac{1}{8}$	$\frac{5}{8}$	1.65	2.85	4.25
9	1	5 $\frac{1}{8}$	1 $\frac{1}{8}$	$\frac{5}{8}$	1.85	3.40	4.75
10	1 $\frac{1}{8}$	6 $\frac{1}{4}$	1 $\frac{1}{4}$	$\frac{3}{4}$	2.75	4.50	6.25
12	1 $\frac{1}{4}$	8	1 $\frac{3}{8}$	$\frac{3}{4}$	4.45	7.00	10.65

Blocks with Patent Bushed Sheaves

SIZES		WITH SIX-ROLLER BUSHED, IRON SHEAVES			WITH SELF-LUBRICATING GRAPHITE-BRONZE BUSHED SHEAVES		
Length of Shell, Inches	For Diam. of Rope, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
4	$\frac{3}{4}$	\$1.20	\$2.25	\$ 3.25	\$1.50	\$ 2.90	\$ 4.15
5	$\frac{5}{8}$	1.25	2.35	3.50	1.75	3.35	4.75
6	$\frac{3}{4}$	1.50	2.85	4.40	2.20	4.00	5.80
7	$\frac{5}{8}$	1.70	3.35	5.00	2.50	4.50	6.70
8	1	2.25	4.15	6.00	3.25	5.70	8.50
9	1	2.50	4.70	7.25	3.70	6.75	10.00
10	1 $\frac{1}{8}$	3.50	6.00	8.50	4.75	8.50	12.50
12	1 $\frac{1}{4}$	5.30	9.20	13.20	6.75	12.50	18.50

Order All Blocks by Length of Shell.

Special ruling for becket in all iron strapped tackle blocks: Becket may be allowed in all single, one-half double, and one-third triple, on any orders without charge. For any additional proportion than above the sum of 5 cents each, net, shall be charged for each additional becket on blocks 5 inch and under, and 1 cent net per inch of shell measurement for each additional becket in sizes larger than 5 inch.

(Above means length of shell regardless of number of mortises.)

These blocks can be furnished with loose swivel hooks if desired. The prices of the swivel hooks are added.

HEAVY PATTERN WOOD SHELL BLOCKS FOR MANILA ROPE

Heavy or Thick Mortise Blocks

Wide Mortise, Double Cross Bolted, Heavy Straps, Heavy Loose Side Hooks



Fig. 201



Fig. 202



Fig. 203

Cuts Show Blocks with Beekets

Order All Blocks by Length of Shell

Blocks with Common Iron Bushed Sheaves

Length of Shell, inches	For Diam. Rope, inches	SIZE OF SHEAVES			Single, Each	Double, Each	Triple, Each
		Diam., inches	Width, inches	Diam. of Pin, inches			
8	1½	4½	1½	¾	\$ 2.75	\$ 4.50	\$ 6.30
10	1½	6½	1½	¾	4.00	6.50	8.50
12	1½	8	1½	¾	5.25	8.50	12.50
14	1½	9½	1½	¾	8.00	13.00	17.00
16	2	11	2½	1	11.50	18.00	28.00

Blocks with Self-Lubricating Graphite-Bronze Bushed Sheaves

Length of Shell, inches	For Diam. Rope, inches	SIZE OF SHEAVES			Single, Each	Double, Each	Triple, Each
		Diam., inches	Width, inches	Diam. of Pin, inches			
8	1½	4½	1½	¾	\$ 5.00	\$ 9.00	\$13.00
10	1½	6½	1½	¾	7.25	13.50	19.00
12	1½	8	1½	¾	9.25	17.00	25.00
14	1½	9½	1½	¾	13.00	23.50	33.00
16	2	11	2½	1	18.00	32.00	48.00

These Blocks may be fitted with our extra strong flattened hooks or with shackles, at special prices. Our self-lubricating graphite-bronze bushed blocks require no oil. Order all blocks by length of shell.

LARGE SIZE THICK MORTISE TACKLE BLOCKS WITH LASHING SHACKLES—FOR MANILA ROPE

These Blocks are Intermediate Between the Regular Thick Mortise and Our Extra Heavy Bullock Blocks



Fig. 206
Double—With Becket



Fig. 207
Triple—No Becket

Dimensions

Length of Shell, inches	For Rope Diam.	SIZE OF SHEAVES		
		Diam., inches	Width, inches	Pin, inches
18	2 1/4	12	2 3/8	1 1/8
20	2 1/2	14	2 7/8	1 1/4
22	2	15	3 3/8	1 1/2
24	3 1/4	16	3 7/8	1 1/2

With Plain Bored Sheaves, Not Bushed

Single Blocks, each	Double Blocks, each	Triple Blocks, each	Quadruple Blocks, each
\$15.00	\$29.00	\$42.00	\$ 57.00
21.00	37.00	54.00	75.00
26.00	48.00	70.00	96.00
32.00	56.00	84.00	116.00

Dimensions

Length of Shell, inches	For Rope Diam.	SIZE OF SHEAVES		
		Diam., inches	Width, inches	Pin, inches
18	2 1/4	12	2 3/8	1 1/8
20	2 1/2	14	2 7/8	1 1/4
22	3	15	3 3/8	1 1/2
24	3 1/2	16	3 7/8	1 1/2

With Self lubricating Graphite Bronze Bushed Sheaves

Single Blocks, each	Double Blocks, each	Triple Blocks, each	Quadruple Blocks, each
\$23.00	\$44.00	\$ 63.00	\$ 86.00
32.00	54.00	77.00	109.00
38.00	70.00	100.00	138.00
46.00	85.00	125.00	171.00

Order by Length of Shell

"BULLOCK" BRAND EXTRA HEAVY PURCHASE WOOD SHELL BLOCKS FOR MANILA ROPE

For Heaviest Loads and Severest Duty. They will Outpull and Outlast all Others



Fig. 302
Double, with Loose Hook



Fig. 303
Triple, with Shackle



Fig. 301
Snatch Block

Furnished with either extra heavy flattened hooks or with shackles, which are much stronger than hooks of the same size.

These blocks are hand-made in our shops from the best materials obtainable. Extra heavy shell, double cross riveted, heavy self-lubricating sheaves with smoothly turned scores, with heavy flattened hooks or shackles. "Bullock" tackle blocks are of great strength and lasting qualities. They are made to stand the hard "wear and tear" occasioned by severe usage, as in bridge erecting, railroad wrecking and heavy construction work. Becketts where wanted.

Hooks are made of one piece of steel. Eyes are punched and worked out, thus avoiding the possibility of an imperfect weld.

All these blocks with Self-Lubricating Graphite-Bronze Bushed Sheaves.

Length of Shell, inches	For Diameter Rope, inches	SIZE OF SHEAVES							
		Diameter	Width	Diameter of Pin	Single, Each	Double, Each	Triple, Each	Quadruple, Each	Quintuple, Each
10	1¼	6¼	1½	¾	\$ 7.25	\$12.50	\$ 19.00	\$ 28.00	\$ 37.00
12	1½	8	1¾	1	9.25	17.00	25.00	35.00	45.00
14	1¾	9½	1⅞	1¼	13.00	23.50	33.00	45.00	65.00
16	2	11	2¼	1½	18.00	32.00	48.00	68.00	90.00
18	2¼	12	2⅝	1¾	23.00	44.00	63.00	90.00	120.00
20	2½	14	2⅞	1⅞	32.00	54.00	77.00	108.00	150.00
22	3	15	3⅛	2	38.00	70.00	100.00	140.00	190.00
24	3½	16	3¾	2¼	46.00	85.00	125.00	175.00	235.00
26	4	16	4½	2½	55.00	95.00	140.00	210.00	290.00

SNATCH BLOCKS

Length of Shell, inches	For Diameter Rope, inches	SIZE OF SHEAVES			
		Diameter	Width	Diameter of Pin	Price, Each
10	1 1/4	5 3/4	1 1/4	1	\$ 12.50
12	1 1/2	6 3/4	1 1/2	1 1/4	14.00
14	1 3/4	8	1 3/4	1 1/2	18.50
16	2	9	2	1 3/4	25.00
18	2 1/4	10	2 1/4	1 3/8	36.00
20	2 1/2	11	2 3/4	1 1/2	52.00
22	3	11 3/4	3 1/4	1 3/4	78.00
24	3 1/2	12 3/4	4 1/4	1 7/8	100.00
26	4	12 3/4	4 3/4	2	115.00

Carried in stock only with our Self-Lubricating Graphite-Bronze Bushed Sheaves, which require no oil or attention, and saves loss of power by friction on each sheave. Blocks of any capacity and number of sheaves furnished promptly. Order all blocks by length of shell.

WOOD SHELL SNATCH BLOCKS FOR MANILA ROPE

Inside and Outside Iron Strapped, Cross Bolted, with Swivel Hook or Bail



Fig. 400

Regular Pattern, Closed



Fig. 400

Regular Pattern, Open



Fig. 405

Snatch Block with Bail

Length of Shell, Inches	For Diameter Rope, Inches	SIZE OF SHEAVE, INCHES			Price Each, with Common Iron Bushed Sheave	Price Each, with Self-Lubricating Bushed Sheave
		Diameter	Width	Diameter of Pin		
8	1 and smaller	4 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{3}{8}$	\$ 5.75	\$ 7.25
9	1 $\frac{1}{4}$	5	1 $\frac{1}{8}$	$\frac{3}{8}$	6.75	8.50
10	1 $\frac{1}{4}$	5 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{3}{8}$	8.50	11.00
12	1 $\frac{1}{2}$	6 $\frac{1}{4}$	2 $\frac{1}{4}$	$\frac{3}{8}$	10.00	13.00
14	1 $\frac{1}{2}$	8	2 $\frac{1}{4}$	$\frac{3}{8}$	13.00	16.50
16	2	9	2 $\frac{3}{8}$	1	17.00	22.00
18	2 $\frac{1}{4}$	10	3	1	25.00	31.00
20	2 $\frac{1}{2}$	11	3 $\frac{1}{2}$	1 $\frac{1}{2}$	38.00	46.00
22	3	11 $\frac{1}{4}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	55.00	68.00
24	3 $\frac{1}{2}$	12 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	70.00	86.00

"SAMSON" EXTRA HEAVY OUTSIDE
STRAPPED SNATCH BLOCKS

FOR MANILA ROPE

Double Cross-Riveted

Flattened Swivel Hooks



Fig. 505

The straps, hooks, etc., of these blocks are hand made of best imported Swedish iron.

The sheaves are extra heavy, with grooves ground smooth.

These blocks are the same high grade as our well-known Bullock brand, *i. e.*, "The best that can be made." But a little different in style.

The Illinois Steel Company, North Works, Chicago, use these blocks in their construction work. In March, 1904, they tested one 12 and one 14 inch; one hook straightened out at 46,000, and the other at 58,800 lbs. The block was not otherwise damaged.

With Self-Lubricating Graphite-Bronze Bushed Sheave

Length of Shell, inches	For Diameter Rope, inches	SIZE OF SHEAVE			Price Each
		Diameter	Width	Diameter of Pin	
10	1 $\frac{1}{4}$	5 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{1}{8}$	\$26.00
12	1 $\frac{1}{2}$	6 $\frac{3}{4}$	2 $\frac{1}{8}$	1 $\frac{1}{4}$	32.00
14	1 $\frac{3}{4}$	8	2 $\frac{1}{4}$	1 $\frac{3}{8}$	45.00
16	2	9	2 $\frac{5}{8}$	1 $\frac{1}{2}$	52.00
18	2 $\frac{1}{4}$	10	3	1 $\frac{3}{4}$	62.00
20	2 $\frac{1}{2}$	11	3 $\frac{1}{2}$	1 $\frac{7}{8}$	72.00
22	3	11 $\frac{3}{4}$	4 $\frac{1}{4}$	2	84.00

Order All Blocks by Length of Shell.

"CHICAGO" STEEL BLOCKS FOR MANILA ROPE**Regular Pattern****Fig. 601****Fig. 602****Fig. 603****Cuts Show Blocks with Our New Style Shackle Beekets**

These blocks are strong and light and of the latest design. The shells are of malleable iron with edges rounded to protect the rope. Sheaves of grey iron with smooth grooves for rope. Large pins. Hooks made of best wrought iron, heavy and well proportioned. All straps extend clear through the shell.

Regular Pattern

Length of shell, inches	For Diam. Rope, inches	COMMON IRON BUSHED			SELF-LUBRICATING BUSHED		
		Single Each	Double Each	Triple Each	Single Each	Double Each	Triple Each
4	1/4	\$0.85	\$1.60	\$ 2.15	\$1.50	\$ 2.90	\$ 4.15
5	5/8	.90	1.75	2.25	1.75	3.35	4.75
6	3/4	1.10	2.00	2.90	2.20	4.00	5.80
7	7/8	1.30	2.40	3.50	2.50	4.50	6.70
8	1	1.65	2.85	4.25	3.25	5.70	8.50
10	1 1/8	2.75	4.50	6.25	4.75	8.50	12.50
12	1 1/4	4.45	7.50	10.65	6.75	12.50	18.50

Heavy or Thick Mortise Pattern

Length of Shell, inches	For Diam. Rope	SIZE OF SHEAVES			COMMON IRON BUSHED			SELF-LUBRICATING BUSHED		
		Diameter	Width	Diam. of Pin	Single	Double	Triple	Single	Double	Triple
12	1 1/2	8	1 5/8	3/4	\$ 5.00	\$ 8.25	\$16.00	\$ 9.00	\$16.00	\$22.00
14	1 3/4	9 1/2	1 7/8	7/8	8.00	12.00	18.00	11.50	22.00	30.00
16	2	11	2 1/4	1	10.00	16.00	21.00	16.00	27.00	36.00

STEEL SNATCH BLOCKS**For Manila Rope****Fig. 420**

Length of Shell, inches	For Rope Diam., inches	SIZE SHEAVE, INCHES			PRICE EACH	
		Diameter	Width	Diameter Pin	Com. Bushed	S. L. Bushed
7	To 3/8	3 1/2	1 1/4	1/2	\$ 5.50	\$ 6.00
8	1	4 1/2	1 3/8	5/8	7.00	7.65
9	1 1/8	5	1 3/8	3/4	8.00	9.00
10	1 1/4	5 3/4	1 7/8	3/4	9.00	10.50
12	1 1/2	6 3/4	2 1/8	3/4	11.50	13.00
14	1 3/4	8	2 1/4	7/8	15.00	16.25
16	2	9	2 5/8	1	20.00	21.75
18	2 1/4	10	3	1	25.00	28.00
20	2 1/2	11	3 1/2	1 1/4	36.00	39.50
22	3	11 3/4	4 1/4	1 1/2	52.00	60.00
24	3 1/2	12 1/2	4 1/2	1 1/2	72.00	85.00

EXTRA HEAVY STEEL BLOCKS FOR MANILA ROPE WITH LASHING SHACKLES



Fig. 710, Double



Fig. 715, Triple



Fig. 720, Snatch Block

These Blocks are exceptionally well made and heavily proportioned throughout.

Used largely by railroad companies on wrecking and derrick cars, and by contractors and bridge builders for extra heavy duty. We furnish them with Lashing Shackles as shown which are stronger than hooks of same size, or with hooks.

Our Self-Lubricating Graphite-Bronze Bushings require no oil or attention and save loss of power by friction on each sheave used.

Length of Shell, inches	For Diam. Rope	SIZE OF SHEAVES			COMMON BUSHED				SELF-LUBRICATING BUSHED			
		Diam.	Width	Diam. of Pin	Single Each	Double Each	Triple Each	Quad'ple Each	Single Each	Double Each	Triple Each	Quad'ple Each
16	2	9	2 1/4	1 1/4	\$17.00	\$ 28.00	\$ 40.00	\$ 57.00	\$ 20.00	\$ 34.00	\$ 49.00	\$ 69.00
18	2 1/4	10	2 3/8	1 1/2	28.00	46.00	65.00	88.50	32.00	54.00	77.00	104.50
20	2 1/2	11	2 7/8	1 3/8	41.00	60.00	80.00	114.00	45.00	68.00	92.00	130.00
22	3	12	3 1/8	1 1/2	50.00	68.00	92.00	128.00	55.00	78.00	107.00	148.00
24	3 1/2	13	3 3/8	2	66.00	85.00	110.00	144.00	72.00	97.00	130.00	175.00
26	4	15	4 1/2	2 3/16	85.00	105.00	140.00	205.00	95.00	125.00	175.00	245.00

Blocks of any capacity or number of sheaves promptly to order.

SNATCH BLOCKS

Length of Shell, inches	For Diam. Rope	SIZE OF SHEAVES			COMMON BUSHED	SELF-LUBRICATING BUSHED
		Diameter	Width	Diam. of Pin	Price Each	Price Each
16	2	9	2 3/8	1	\$ 25.00	\$ 27.50
18	2 1/4	10	3	1 1/4	31.25	35.00
20	2 1/2	11	3 1/2	1 1/2	45.00	49.50
22	3	11 1/2	4 1/4	1 3/4	65.00	75.50
24	3 1/2	12 1/4	4 3/4	1 3/4	90.00	106.50
26	4	12 3/4	4 3/4	2	100.00	115.00

Order all blocks by length of shell.

REGULAR PATTERN DIAMOND SHELL STEEL BLOCKS FOR WIRE ROPE

ORDER THESE BLOCKS BY DIAMETER OF SHEAVES



Fig. 725, Single



Fig. 730, Double



Fig. 735, Triple

BECKETS FURNISHED WHERE DESIRED

We usually furnish blocks with stiff swivel hooks as shown above, but can supply blocks with loose hooks to order at same prices.

PRICES WITH COMMON IRON BUSHED SHEAVES

Diameter of Sheaves, inches	For Wire Rope, Diameter, inches	Thickness of Sheaves, inches	Size of Pin Hole in Sheaves, inches	Single, Each	Double, Each	Triple, Each	Quadruple, Each	Quintuple, Each
10	$\frac{3}{8}$ and $\frac{1}{2}$	$1\frac{1}{4}$	1	\$10.00	\$15.00	\$20.00	\$26.00	\$32.50
12	$\frac{5}{8}$	$1\frac{3}{8}$	1	12.00	17.50	23.00	29.50	36.50
14	$\frac{5}{8}$ and $\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	14.00	20.00	26.00	33.00	40.50
16	$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	16.00	23.00	30.00	38.00	46.50
18	$\frac{3}{4}$ and $\frac{7}{8}$	2	$1\frac{1}{2}$	20.00	28.00	36.00	45.00	54.50

PRICES WITH SELF-LUBRICATING GRAPHITE-BRONZE BUSHED SHEAVES

Diameter of Sheaves, inches	For Wire Rope, Diameter, inches	Thickness of Sheaves, inches	Size of Pin Hole in Sheaves, inches	Single, Each	Double, Each	Triple, Each	Quadruple Each	Quintuple Each
10	$\frac{3}{8}$ and $\frac{1}{2}$	$1\frac{1}{4}$	1	\$13.00	\$21.00	\$29.00	\$38.00	\$47.50
12	$\frac{5}{8}$	$1\frac{3}{8}$	1	15.00	23.50	32.00	41.50	51.50
14	$\frac{5}{8}$ and $\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	17.00	26.00	35.00	45.00	55.50
16	$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	19.50	30.00	40.50	52.00	64.00
18	$\frac{3}{4}$ and $\frac{7}{8}$	2	$1\frac{1}{2}$	24.00	36.00	48.00	61.00	74.50

Order these Blocks by Diameter of Sheaves

We always ship blocks self-lubricating bushed unless specified otherwise. They require no oil and save loss of power by friction on each sheave used.

HEAVY PATTERN DIAMOND SHELL STEEL BLOCKS

For Wire Rope
Order These Blocks by Diameter of Sheaves

Fig. 740.
SingleFig. 745.
DoubleFig. 750.
Triple, with Shackle

We always furnish these blocks with swivel flattened hooks unless otherwise specified. Blocks with shackles or loose hooks at the same prices to order.

Prices with Common Iron Bushed Sheaves

Diameter of Sheaves, inches	For Wire Rope, Suitable, inches	Thickness of Sheaves, inches	Size of Pinhole in Sheaves	Single, Each	Double, Each	Triple, Each	Quadruple, Each	Quintuple, Each
10	1 1/2	1 3/8	1	\$14.00	\$22.00	\$32.00	\$42.00	\$ 52.00
12	5/8	1 3/8	1 1/4	16.00	25.00	35.00	45.00	55.00
14	5/8-3/4	1 3/4	1 1/2	18.00	28.00	40.00	52.00	64.00
16	3/4	1 3/4	1 1/2	31.00	43.00	55.00	67.00	79.00
18	3/4-7/8	2	1 3/4	34.50	48.50	63.50	78.50	93.50
20	7/8-1	2 1/4	1 1/2	38.50	54.50	72.50	90.50	108.50

Prices with Self-lubricating Graphite Bronze Bushed Sheaves

Diameter of Sheaves, inches	For Wire Rope, Suitable, inches	Thickness of Sheaves, inches	Size of Pinhole in Sheaves	Single, Each	Double, Each	Triple, Each	Quadruple Each	Quintuple, Each
10	1 1/2	1 3/8	1	\$17.00	\$28.00	\$41.00	\$ 54.00	\$ 67.00
12	5/8	1 3/8	1 1/4	19.50	32.00	45.50	59.00	72.50
14	5/8-3/4	1 3/4	1 1/2	22.00	36.00	52.00	68.00	84.00
16	3/4	1 3/4	1 1/2	35.00	51.00	57.00	83.00	99.00
18	3/4-7/8	2	1 3/4	40.00	59.50	80.00	90.50	121.00
20	7/8-1	2 1/4	1 1/2	45.00	67.50	92.00	116.50	141.00

These blocks have heavier hooks, straps and pins than our regular pattern wire rope blocks.

We can furnish these blocks without hooks or with detachable swivel hooks. Use the same list prices as above.

We can furnish these blocks also, heavily weighted for use on tall buildings.

With Detachable
Swivel Hooks

Without Hooks

EXTRA HEAVY STEEL BLOCKS FOR WIRE ROPE

With Lashing Shackles



Double, with Becket



Quadruple

These are the heaviest and best blocks made. Straps, pins, shackles, and every part are exceptionally well made, of the best materials. Used by railroads for wrecking cars; by contractors and bridge erectors for the heaviest loads and severest duty.

PRICES WITH COMMON IRON BUSHED SHEAVES

Diameter of Sheaves, inches	For Wire Rope, Suitable, inches	Thickness of Sheaves, inches	Size of Pinhole in Sheaves, inches	Single, Each	Double, Each	Triple, Each	Quadruple, Each	Quintuple, Each
16	$\frac{3}{4}$ and $\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{1}{8}$	\$35.00	\$ 50.00	\$ 70.00	\$ 90.00	\$115.00
18	$\frac{3}{4}$, $\frac{7}{8}$ and 1	2	$1\frac{1}{8}$	45.00	63.00	88.00	113.00	143.00
21	$\frac{7}{8}$, 1 and $1\frac{1}{8}$	$2\frac{1}{4}$	2	55.00	77.50	107.50	137.50	175.00
24	$1\frac{1}{8}$ and $1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{16}$	70.00	95.00	127.50	160.00	200.00
26	$1\frac{1}{8}$ and $1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{16}$	85.00	115.00	152.50	190.00	240.00

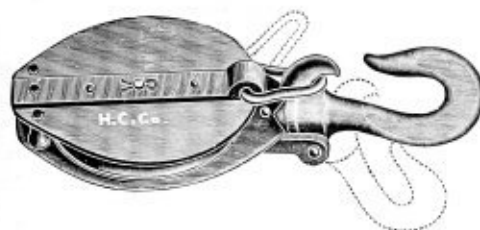
PRICES WITH SELF-LUBRICATING GRAPHITE BRONZE BUSHED SHEAVES

Diameter of Sheaves, inches	For Wire Rope, Suitable, inches	Thickness of Sheaves, inches	Size of Pinhole in Sheaves, inches	Single, Each	Double, Each	Triple, Each	Quadruple, Each	Quintuple, Each
16	$\frac{3}{4}$ and $\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{1}{8}$	\$40.00	\$ 60.00	\$ 85.00	\$110.00	\$140.00
18	$\frac{3}{4}$, $\frac{7}{8}$ and 1	2	$1\frac{1}{8}$	50.00	73.00	103.00	133.00	168.00
21	$\frac{7}{8}$, 1 and $1\frac{1}{8}$	$2\frac{1}{4}$	2	62.50	92.50	130.00	167.50	212.50
24	$1\frac{1}{8}$ and $1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{16}$	80.00	115.00	157.50	200.00	250.00
26	$1\frac{1}{8}$ and $1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{16}$	95.00	135.00	182.50	230.00	290.00

We always furnish Blocks with our Self-Lubricating Graphite Bronze Bushings, unless otherwise specified. They require no oil; save in loss of power by friction on each sheave.

Order These Blocks by Diameter of Sheaves

HEAVY PATTERN WIRE ROPE SNATCH BLOCKS



Diameter of Sheave, inches	For Wire Rope, Suitable	Thickness of Sheave, inches	Diameter of Pin, inches	PRICE EACH	
				With Common Iron Bushed Sheave	With Self-Lubricating Bushed Sheave
10	$\frac{1}{2}$	$1\frac{1}{8}$	1	\$16.00	\$19.00
12	$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	18.00	21.00
14	$\frac{3}{8}$ and $\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	20.00	23.00
16	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	33.00	38.00
18	$\frac{3}{4}$ and $\frac{7}{8}$	2	$1\frac{3}{4}$	38.00	44.00
20	$\frac{7}{8}$ and 1	$2\frac{1}{4}$	$1\frac{1}{2}$	45.00	53.00
22	1	$2\frac{1}{2}$	$1\frac{1}{2}$	55.00	65.00

EXTRA HEAVY SNATCH BLOCKS FOR WIRE ROPE

With Flattened Hooks



Diameter of Sheave, inches	For Wire Rope, Suitable	Thickness of Sheave, inches	Diameter of Pin, inches	PRICE EACH	
				With Common Iron Bushed Sheave	With Self-Lubricating Bushed Sheave
10	$\frac{1}{2}$ and $\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{4}$	\$22.00	\$ 27.00
12	$\frac{5}{8}$ and $\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{8}$	25.00	30.00
14	$\frac{3}{4}$ and $\frac{7}{8}$	$1\frac{3}{4}$	$1\frac{1}{2}$	35.00	40.00
16	$\frac{3}{4}$, $\frac{7}{8}$ and 1	2	$1\frac{3}{4}$	45.00	52.00
18	1 and $1\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{3}{4}$	55.00	65.00
20	$1\frac{1}{8}$ and $1\frac{1}{4}$	$2\frac{1}{4}$	$1\frac{1}{2}$	60.00	70.00
22	$1\frac{1}{4}$ and $1\frac{3}{4}$	$2\frac{1}{4}$	$1\frac{1}{2}$	70.00	80.00
22	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{8}$	85.00	100.00



Fig. 575

CHANNON NEW STYLE CARGO HOISTERS

For Manila Rope

These blocks are galvanized and have swivel hooks. The sheaves have wooden projecting cheeks as shown in cut at right, and self-lubricating bushings.

The finest block made for hoisting coal, cargoes from the holds of boats, hay, etc.

Used in sinking deep foundation holes, Chicago system.



Style Sheaves furnished in these Blocks

No.	Length of Shell, Inches	For Diameter of Rope, Inches	SIZE OF SHEAVES, INCHES			Price Each
			Diameter	Width	Diam. of Pin	
30	5½	¾	4¼	1	½	\$ 4.00
31	6½	¾	5	1½	¾	5.00
32	7½	1	5½	1½	¾	6.00
33	8½	1½	6½	1¾	¾	8.00
34	10	1¼	7½	1½	¾	10.50
35	11½	1¼	9	1½	¾	13.00
36	12½	1½	10	1¾	¾	16.00
37	14	1½	11½	1¾	¾	20.00
38	16½	1¾	13½	2	1	26.00

WROUGHT IRON GIN BLOCKS FOR ICE TRADE

With Swivel Hooks and Self-Lubricating Bushed Sheaves

FOR MANILA ROPE



Upper Block

Diameter of Sheaves, inches	For Rope Suitable	PRICE EACH	
		Upper Block	Lower Block
8	1	\$ 5.00	\$ 5.75
10	1¼	6.00	6.75
12	1½	7.50	8.25
14	1¾	9.00	10.00
16	2	10.50	11.50



Lower Block

WROUGHT IRON GIN BLOCKS FOR MANILA ROPE

Stiff Swivel Hooks

LIGHT PATTERN



Light Pattern

Diameter of Sheave, inches	For Rope, Suitable	PRICE EACH	
		Common Iron Bushed	Self-Lubricating, Metaline or Bronze Bushed
6	1	\$ 3.15	\$ 4.75
8	1	3.85	5.50
10	1	4.55	6.55
12	1	5.80	7.90
16	1¼ or 1½	8.40	10.70
20	1½	11.90	14.00

HEAVY PATTERN

Diameter of Sheave, inches	For Rope, Suitable	PRICE EACH	
		Common Iron Bushed	Self-Lubricating, Metaline or Bronze Bushed
8	1¼	\$ 6.00	\$ 8.00
10	1½	8.00	10.00
12	1½	10.00	12.00
15	1¾	12.00	15.00
18	1¾	15.00	20.00



Heavy Patterns

"UNION" WELL WHEELS Japped



Extra Heavy

Frame and wheel of grey iron, hooks of wrought iron. Extra heavy pattern has also wrought strap. Wheels fitted with our self-lubricating bronze bushings are noiseless and require no oil.

Regular Pattern

Diameter of Wheel, inches	Common Bushed, Each	Bronze Bushed, Each
8	\$1.75	\$2.50
10	2.00	3.00
12	2.50	3.50

Extra Heavy Pattern

Diameter of Wheel, inches	Common Bushed, Each	Bronze Bushed, Each
8	\$3.00	\$3.75
10	3.25	4.25
12	4.00	5.00



LUMBERMEN'S LOADING BLOCKS

Wrought steel shells, cast sheave, size 5 x 1 1/8 inches.

Price, with stiff swivel hook, each..\$2.25

FERRY TRAVELERS

For Wire Rope



Single Single Travelers



Double Double Travelers

Diameter of Sheave	Price Each, with Common Sheaves	Price Each, with Self-Lubricating Sheaves	Price Each, with Common Sheaves	Price Each, with Self-Lubricating Sheaves
6	\$5.00	\$7.00	\$8.00	\$12.00
8	6.00	8.00	9.00	13.50
10	8.00	10.50	12.00	17.00
12	10.00	12.50	15.00	20.00
14	12.00	15.00	17.00	24.00

In ordering state size of rope upon which Traveler is to be used.

CHANNON SPECIAL COAL HOISTING BLOCK

For Wire Rope

These blocks are especially popular for coal yard use, as they have riveted guards, which prevent rope from jumping the sheaves. They have extra strong flattened hooks, and self-lubricating sheaves.



Fig. 500

Diameter of Sheave, inches	For Wire Rope, Suitable	Price Each
10	5/8	\$12.00
12	5/8	15.00
14	3/4	20.00

WROUGHT IRON GIN BLOCKS FOR WIRE ROPE

Self-lubricating Bushed Sheaves. Stiff Swivel Hooks



Diameter of Sheave, inches	For Wire Rope, Suitable, inches	PRICE EACH		
		Single	Double	Triple
10	1/2	\$11.00	\$18.00	\$25.00
12	1/2 and 5/8	12.50	20.00	27.50
14	5/8	15.00	23.00	31.00
16	5/8 and 3/4	18.00	27.00	36.00
18	3/4 and 7/8	22.00	32.00	41.00
20	7/8	28.00	38.00	48.00

H.Channon Company. Chicago.

GALVANIZED TACKLE BLOCKS

With Wrought Iron Hooks and Straps and Steel Pins



Single



Double

No.	For Rope, Size, inches	Price	
		Common Bushed	Patent Bushed
9	$\frac{1}{2}$	\$0.85	\$1.30
11	$\frac{3}{8}$	.95	1.50
13	$\frac{1}{2}$	1.10	1.75
15	$\frac{3}{4}$	1.30	2.00
19	1	1.85	2.75

No.	For Rope, Size, inches	Price	
		Common Bushed	Patent Bushed
10	$\frac{1}{2}$	\$1.25	\$2.35
12	$\frac{3}{8}$	1.50	2.65
14	$\frac{1}{2}$	1.75	3.00
16	$\frac{3}{4}$	2.40	3.50
20	1	3.25	4.75

GALVANIZED BLOCKS WITH FAST EYES

With or Without Becketts



*Single, no Becket

*Double, with Becket

Single

Size, No.	Length of Shell, inches	Diameter of Rope, inches	Size of Sheave, inches	Price Each	Price per Dozen
1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2} \times \frac{3}{4}$	\$0.67	\$ 8.05
3	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4} \times 1$	.90	10.80
5	1	$\frac{3}{4}$	$1 \times 1 \frac{1}{2}$	1.15	13.80
7	$1 \frac{1}{4}$	1	$1 \frac{1}{2} \times 1 \frac{3}{4}$	1.40	16.80
9	$1 \frac{3}{4}$	$1 \frac{1}{2}$	$1 \frac{3}{4} \times 2$	1.65	19.80
11	2	1	$2 \times 2 \frac{1}{2}$	1.90	22.80
13	$2 \frac{1}{4}$	$1 \frac{1}{2}$	$2 \frac{1}{2} \times 3$	2.15	25.80
15	$2 \frac{3}{4}$	2	$3 \times 3 \frac{1}{2}$	2.40	28.80

Double

Size, No.	Length of Shell, inches	Diameter of Rope, inches	Size of Sheave, inches	Price Each	Price per Dozen Galvanized
2	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2} \times \frac{3}{4}$	\$0.11	\$ 1.30
4	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4} \times 1$	.16	1.90
6	1	$\frac{3}{4}$	$1 \times 1 \frac{1}{2}$	.20	2.40
8	$1 \frac{1}{4}$	1	$1 \frac{1}{2} \times 1 \frac{3}{4}$	.25	3.00
10	$1 \frac{3}{4}$	$1 \frac{1}{2}$	$1 \frac{3}{4} \times 2$	.30	3.60
12	2	1	$2 \times 2 \frac{1}{2}$	.35	4.20
14	$2 \frac{1}{4}$	$1 \frac{1}{2}$	$2 \frac{1}{2} \times 3$	.40	4.80
16	$2 \frac{3}{4}$	2	$3 \times 3 \frac{1}{2}$	.45	5.40

*Furnished without becket unless otherwise specified.

BLOCKS WITH LOOSE WROUGHT IRON HOOKS

Shells of Galvanized Malleable Iron



Double, no Becket

Single

Size, No.	Length of Shell, inches	Diameter of Rope, inches	Price Each	Price per Dozen
3	$1 \frac{1}{4}$	$\frac{1}{2}$	\$0.30	\$3.60
5	$1 \frac{3}{4}$	$\frac{3}{4}$	.35	4.20
7	2	1	.40	4.80
9	$2 \frac{1}{4}$	$1 \frac{1}{2}$	.50	6.00
11	$2 \frac{3}{4}$	2	.60	7.20

Double

Size, No.	Length of Shell, inches	Diameter of Rope, inches	Price Each	Price per Dozen
4	$1 \frac{1}{2}$	$\frac{1}{2}$	\$0.35	\$4.20
6	$1 \frac{3}{4}$	$\frac{3}{4}$	.45	5.40
8	2	1	.55	6.60
10	$2 \frac{1}{4}$	$1 \frac{1}{2}$	.65	7.80
12	$2 \frac{3}{4}$	2	.70	8.40

SWIVEL EYE AWNING BLOCKS

Galvanized Malleable Iron

Single

Double



Single

No.	Length Shell, inches	For Rope, Size, inches	Each	Dozen
0		$\frac{1}{4}$	\$0.06	\$0.60
1	$1 \frac{1}{8}$	$\frac{1}{2}$	.07	.80
2	$1 \frac{1}{4}$	$\frac{3}{4}$	.10	1.20
3	$1 \frac{3}{8}$	1	.15	1.80
5	$1 \frac{5}{8}$	$1 \frac{1}{2}$	.20	2.40
7	$2 \frac{1}{4}$	$1 \frac{3}{4}$	.25	3.00

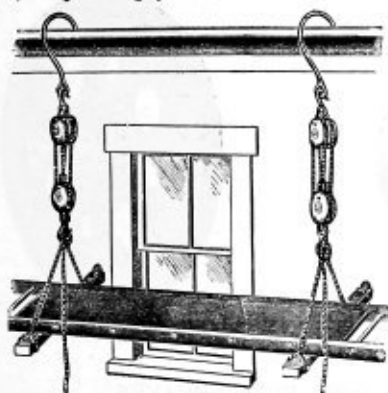
No.	Length Shell, inches	For Rope, Size, inches	Each	Dozen
00		$\frac{1}{2}$	\$0.08	\$0.75
2	$1 \frac{1}{4}$	$\frac{3}{4}$	.10	1.20
4	$1 \frac{3}{4}$	1	.15	1.80
6	2	$1 \frac{1}{2}$	.20	2.25



Double

PAINTERS' FALLS

Falls complete consist of two sets of blocks, necessary rope, hooks for roof or gutters, rope strapped bunters, straps and guy lines.



Prices of Falls Only

Length, feet	Diameter Rope, in.	Per Set of Two	Length, feet	Diameter Rope, in.	Per Set of Two
40	3/4	\$25.00	50	3/4	\$33.25
50	"	29.75	60	"	36.90
60	"	32.50	70	"	40.50
70	"	35.50	80	"	44.10
80	"	38.25	90	"	47.70
40	3/4	29.70	100	"	51.30

Prices do not include hooks or rollers. Shorter or longer falls at proportionate prices.

HOOKS, STIRRUPS, GUY LINES, ETC.

Extras	Per Set
Straps, Stirrups and guy lines, 40' to 60' falls	\$2.00
" " " " " 70' to 125' "	3.00
Steel hooks.....	5.00
Drop cloths, per square foot.....	.02 1/2

PAINTERS' STAGES

Made of clear Norway pine with hickory rungs. Floored with pine flooring, 4 inches wide. Made 20 inches wide unless otherwise ordered.

14 feet.....each,	\$ 8.00	22 feet.....each,	\$12.00
16 " " " " " "	9.00	24 " " " " " "	14.00
18 " " " " " "	10.00	26 " " " " " "	16.00
20 " " " " " "	11.00	28 " " " " " "	18.00
Cross Bars with rollers.....per pair,	1.50		

PAINTERS' TRESTLES

Made of clear Norway pine, hickory rungs, heavy screws, bolted together with wrought iron screw bolts.

Length, feet	Price Each	Length, feet	Price Each
6	\$ 6.00	12	\$12.00
7	7.00	14	15.00
8	8.00	16	18.00
10	10.00	18	21.00



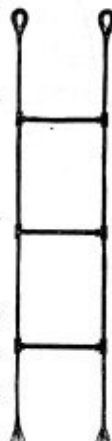
*Sections can be made longer than 20 feet, but they cannot be shipped by freight in less than car lots, except at a prohibitive rate.

*COMMON LONG LADDERS

Made of Norway pine, rails and rungs of hickory. Each rung set into the rail one inch with a tenon and secured in place with casing nails, so driven that the rail cannot twist and separate.



Length, feet	Price per Foot
10 to 16	\$0.16
18	.18
20	.20



MANILA AND WIRE ROPE LADDERS

We make any size manila or wire rope ladders to sustain any weight desired.

Wire rope ladders are fitted with iron rungs.

Manila rope ladders are fitted with wooden rungs.

Prices quoted on application.

*EXTENSION LADDER

Made same as long ladders, with single piece double roller top iron and heart-shaped malleable iron bottom hooks.

Length of Sections, feet	Weight per Foot, Lbs.	Made in Two Sections Price per Foot	Net Extra for Three Sections
8 to 16	2 1/2	\$0.24	\$2.00
18	3	.26	2.00
20	3	.28	2.00

SAMPSON STEP LADDERS

Made of clear Norway pine. Legs are connected by a flat-headed rivet and reinforced by a band iron lug securely riveted to the stile. Each step is fitted into groove in stiles and securely bound by an iron tie band. Iron drive braces are driven edgewise into the inner side of the stile and under side of step. Held in place by barbed nails driven through holes drilled in the ends. The strongest and best step ladder on the market.

Lengths, feet	Price per Foot
4 to 7	\$0.40
8 to 12	.44
14	.50
16	.56

Shelf Attachment.....	\$0.20 net
Stair " " " " " "	1.00 "

SHEAVES FOR MANILA AND WIRE ROPE



Common Iron Bushed Manila Rope Sheave.



Our Self-Lubricating Graphite-Bronze Bushings require no oil or attention and save loss of power by friction on each sheave.



Self-Lubricating Graphite-Bronze Bushed Wire Rope Sheave.

MANILA ROPE SHEAVES

WIRE ROPE SHEAVES

Diameter, inches	Thickness, inches	PRICE EACH		Diameter, inches	Thickness, inches	Size Pin Hole	For Wire Rope	PRICE EACH	
		Common Iron Bushed	Self-Lubricat- ing Bushed					Common Bushed	Self-Lubricat- ing Bushed
1 3/4	1/2	\$0.09	.....	3	5/8	3/8	1/4	\$ 0.40	\$ 1.30
2	1/2	.10	\$ 0.60	4	3/4	1/2	3/8	.45	1.45
2 1/4	5/8	.12	.70	5	7/8	1/2	3/8	.60	1.50
2 3/4	3/4	.15	.80	6	1	5/8	3/8	.70	1.65
3	3/4	.20	.90	6	1	3/4	1/2	.75	2.00
3 1/2	7/8	.25	1.35	7	1	3/4	1/2	1.20	2.50
3 1/2	1	.25	1.40	8	1	3/4	1/2	1.25	2.65
4 1/4	1	.30	1.50	8	1 1/8	3/4	1/2	1.35	2.90
4 1/2	1 1/8	.50	1.75	8	1 1/4	3/4	3/8	1.50	3.10
4 3/4	1 1/8	.35	1.85	10	1 1/4	7/8	1/2	1.75	3.75
4 3/4	1 1/8	.40	2.00	10	1 1/4	7/8	3/8	2.10	4.00
5	1 1/8	.60	2.00	10	1 1/4	1	3/8	2.20	4.50
5 1/2	1 1/8	.45	1.95	10	1 3/8	1	3/4	2.50	5.00
5 3/8	1 3/8	.50	2.10	10	1 3/8	1 1/8	3/4	2.75	5.25
5 3/4	1 3/8	1.20	3.00	10	1 3/8	1 1/4	3/4	3.00	5.50
6 1/4	1 1/4	.55	2.40	11	1 1/2	1 1/4	3/4	3.50	6.50
6 1/4	1 1/2	.65	2.75	12	1 3/8	1	3/4	2.90	5.50
6 3/4	2 1/8	1.50	3.75	12	1 3/8	1 1/8	3/4	3.25	6.00
7 1/4	1 1/4	.70	2.60	12	1 3/8	1 1/4	3/4	3.50	6.50
7 1/4	1 1/2	.85	2.95	12	1 3/8	1 1/2	3/4	3.75	7.00
8	1 3/8	.90	2.95	14	1 3/4	1	3/4	3.50	7.00
8	1 3/8	1.05	3.25	14	1 3/4	1 1/4	3/4	4.00	8.00
8	1 3/8	1.05	3.40	14	1 3/4	1 1/2	3/4	4.50	9.00
8	2 1/4	1.80	4.50	16	1 3/4	1	3/8	4.00	8.00
9	1 1/2	1.20	3.25	16	1 3/4	1 1/4	3/8	4.50	8.50
9	1 3/4	1.35	3.60	16	1 3/4	1 1/2	3/8	5.50	10.00
9	2 5/8	2.25	5.50	17 1/2	2 1/4	1 1/2	3/8	11.00	18.00
9 1/2	1 3/8	1.40	3.45	17 1/2	2 1/4	1 3/8	3/8	13.00	21.00
9 1/2	1 7/8	1.50	3.75	18	2	1 1/2	3/8	7.00	13.50
10	1 3/8	1.50	3.80	18	2	1 1/2	3/8	8.00	15.00
10	1 7/8	1.70	4.10	18	2 1/4	1 1/2	1	8.50	15.00
10	3	3.00	7.00	18	2 1/4	1 3/8	1	11.00	18.50
11	1 3/4	1.70	4.25	21	2 1/2	1 3/8	1 1/4	18.00	27.00
11	2 1/4	2.00	5.50	21	2 1/2	1 3/8	1 1/2	21.00	30.00
11	3 1/2	4.00	9.00	....	....	....	....	....	....
11 3/4	4 1/4	6.00	12.00	....	....	....	....	....	....
12	2 3/8	3.00	7.00	....	....	....	....	....	....
12 1/2	4 1/2	8.00	15.00	....	....	....	....	....	....

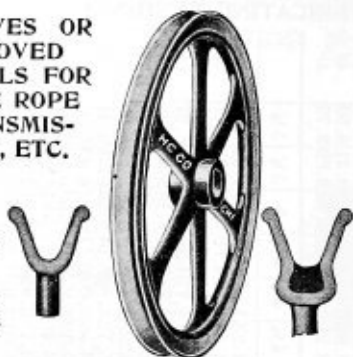
We have Patterns for a great many other sizes. In ordering Sheaves that are to be used in tackle blocks, be sure and state exact diameter, thickness and size of pin hole.

PLAIN AND FLANGED SELF-LUBRICATING BUSHINGS.

LENGTHS WITH PRICE OF PLAIN BUSHINGS.														Add for Flanged Bushing																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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SHEAVES OR GROOVED WHEELS FOR WIRE ROPE TRANSMISSION, ETC.

With either Rubber Lined or Turned Grooves



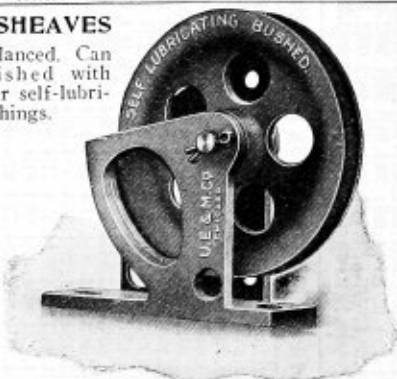
Well balanced. They should be fitted true on shaft, and shaft set at right angles to line of transmission.

Prices Include Boring and Keyseating. Price Each

Diameter, inches	For 3/8 or 1/2 in. Rope	For 5/8 or 3/4 in. Rope	For 7/8 or 1 in. Rope	For 1 1/8 or 1 1/4 in. Rope
18	\$12.00			
24	15.75			
30	19.00	\$26.50		
36	24.50	32.00	\$38.00	
42	30.00	37.00		
48	36.00	43.75	50.00	
54	44.00	49.00		
60	60.00	64.00	72.50	
66		70.00		
72		74.00	85.00	
84		96.00	115.00	
96		125.00		\$165.00
108				191.00
120				231.00

GATE SHEAVES

Well balanced. Can be furnished with common or self-lubricating bushings.



Size, inches	Common Bushed	Self-Lubricating Bushed
4	\$1.50	\$2.75
6	3.00	5.00

RUBBER SHEAVE FILLING



Sizes and Prices of Sheave Filling Shown Elsewhere in This Catalog

SHEAVES WITH STEEL AXLES AND JOURNAL BOXES



DIMENSIONS			Common Sheave with Steel Axle and Journal Boxes, Each	Self-Lubricating Sheave with Steel Axle and Journal Boxes, Each
Diameter, Inches	Thickness of Hub, Inches	Hole for Pin, Inches		
6	1 1/4	1	\$3.40	\$4.60
6	1 1/2	1	3.50	4.80
7	1 1/4	1	3.60	4.80
7	1 1/2	1	3.70	5.00
8	1 1/2	1 1/8	4.00	5.20
8	1 3/4	1 1/8	4.10	5.40
9	1 1/2	1 1/8	4.40	5.70
9	1 3/4	1 1/8	4.50	6.00
10	1 1/2	1 1/8	4.80	6.20
10	1 3/4	1 1/8	5.00	6.50
10	1 3/4	1 1/2	5.20	6.80
12	1 3/4	1 1/8	5.60	7.20
12	1 3/4	1 1/2	5.90	7.50
12	2	1 1/8	6.10	7.60
14	1 3/4	1 1/8	6.40	8.10
14	1 3/4	1 1/2	6.70	8.50
14	2	1 1/8	7.00	8.90
16	1 3/4	1 1/8	7.40	9.40
16	2	1 1/8	7.80	10.00
18	1 3/4	1 1/8	8.50	10.80
18	2	1 1/8	8.90	11.40
20	2	1 1/4	9.50	12.00
22	2 1/4	1 1/4	10.70	13.10
24	2 1/4	1 1/4	12.50	15.20
26	3	1 1/4	14.50	17.50
28	3	1 1/2	17.00	20.20
30	3	1 1/2	21.50	26.50

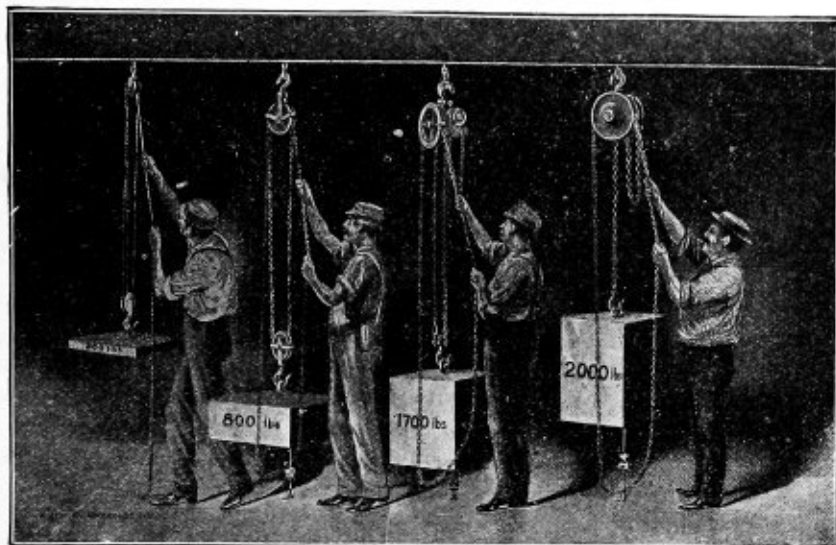
When ordering sheaves, always state the diameter of wire rope to be used.

EXTRA HEAVY SHEAVES

With Shaft and Boxes
Designed for Mining and Other Purposes

Diameter, Inches	Size Rope, Inches	Weight Sheave Only	Weight With Shaft and Boxes
18	3/4	86 lbs.	120 lbs.
24	3/4	115 "	190 "
30	3/4	165 "	315 "
36	3/4	250 "	430 "
42	3/4	440 "	665 "
48	3/4	460 "	750 "
60	1	900 "	1,200 "
66	1	1,100 "	1,400 "
72	1 1/2	1,200 "	1,800 "
84	1 1/2	1,530 "	2,400 "

CHAIN HOISTS



Equal Work for Half-a-Minute

Differential hoists, capacity $\frac{1}{4}$ to 3 tons.

Screw geared hoists, for general hoisting. The cheapest reliable chain hoist. Capacity, $\frac{1}{4}$ to 10 tons.

Triplex spur geared hoists, for constant use, speed, minimum of labor and best economy. Capacity, $\frac{1}{4}$ to 20 tons.

COMPARISON

The figures given below will aid in selecting the most suitable block for various purposes and conditions of use.

Capacity in Tons	PULL IN POUNDS RE- QUIRED ON HAND CHAIN TO LIFT FULL LOADS			FEET OF HAND CHAIN TO BE PULLED BY OPER- ATOR TO LIFT LOAD ONE FOOT HIGH			HOISTING SPEEDS. FEET PER MINUTE ATTAINABLE AND NO. OF MEN REQUIRED FOR HOISTING FULL LOADS WITHOUT PULLING OVER 80 LBS										LOAD ONE MAN CAN HANDLE WITHOUT PULL- ING OVER 80 LBS.		
	Tri- plex, Spur Geared	Screw Geared	Differ- ential	Tri- plex, Spur Geared	Screw Geared	Differ- ential	TRIPLEX, SPUR GEARED				SCREW GEARED		DIFFERENTIAL		Tri- plex, Spur Geared	Screw Geared	Differ- ential		
							Full Load	Half Load	Quarter Load	No. of Men	Full Load	No. of Men	Full Load	No. of Men					
$\frac{3}{4}$			72			18								6.00	1			500	
$\frac{1}{2}$	62	68	122	21	40	24	8.0	16.0	24.0	1	4.00	1	6.00	2	1000	1000	600		
1	82	87	216	31	59	30	4.0	8.0	12.0	1	2.00	1	3.70	3	2000	1700	800		
$1\frac{1}{2}$	110	94	246	35	80	36	4.8	9.6	14.4	2	2.40	2	2.50	3	2300	2500	1000		
2	120	115	308	42	93	42	3.6	7.2	10.8	2	1.80	2	2.30	4	2600	2700	1100		
3	114	132	557	69	126	38	2.3	4.6	6.9	2	1.10	2	2.30	7	4000	3300	1000		
4	124	142		84	155		1.7	3.5	5.2	2	.80	2			5000	4600			
5	110	145		126	195		1.3	2.6	3.9	2	.55	2			6500	5300			
6	130	145		126	252		1.1	2.2	3.3	2	.50	2			7000	6500			
8	135	160		158	310		.8	1.6	2.4	2	.35	2			9000	7800			
10	140	160		210	390		.6	1.2	1.8	2	.30	2			11000	10000			
12	130*			126*			1.1	2.2	3.3	4					13000				
16	135*			168*			.8	1.6	2.4	4					17000				
20	140*			210*			.6	1.2	1.8	4					20000				

*On each of the two hand chains.

The speed of Chain Blocks depends on the Pull required at the Hand Chain, and the distance the latter must travel to lift the load the required distance.

The convenience of Chain Blocks for many purposes depends on weight and head-room.

CHANNON-WESTON DIRECT DIFFERENTIAL CHAIN HOISTS

Holds the load at any point

Capacity $\frac{1}{4}$ to 3 tons

This is the simplest and cheapest type of chain hoist, and has the fewest parts of any block made.

Our blocks are well designed and proportioned, and considerably better than most makes of this type of hoists as now made in this country and England.

The chains are hand made especially for us, and are finely finished and hardened to prevent wear.

The sheaves are large, and the pockets or teeth for chain are carefully formed to mesh accurately with the chain, assuring smooth working, and thus lessening the tendency of the chain to stretch when overloaded. In this way, long service is obtained before it loses the accurate adjustment, without which rapid wear occurs.

While this hoist requires more power than a worm or spur geared hoist, it lifts at higher speed.

PRICE LIST OF COMPLETE BLOCKS

No.	Capacity, Tons	Will Lift, Feet	Price Each	Price, Extra Lift, per Ft.	Regular Chain	Extra Chain, per Ft.	Weight with Chain	Shortest Distance Between Hooks
1	$\frac{1}{4}$	6	\$18.00	\$2.80	22 ft.	\$0.70	20 lbs.	17 in.
2	$\frac{1}{2}$	7	21.00	2.80	26 "	.70	31 "	21 "
3	1	8	28.00	3.00	30 "	.75	53 "	26 "
4	1 $\frac{1}{2}$	8 $\frac{1}{2}$	36.00	3.20	33 "	.80	90 "	32 "
5	2	9	45.00	3.40	36 "	.85	128 "	39 "
6	3	10	60.00	4.00	38 "	1.00	167 "	44 "

Allow **four** feet of Chain for each additional foot of lift.

PARTS FOR REPAIRS

Name of Parts	Capacity in Tons					
	$\frac{1}{4}$	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	3
Top Sheave.....	\$ 3.60	\$ 4.80	\$ 6.00	\$ 8.40	\$12.00	\$15.60
Bottom Sheave.....	.90	1.30	1.50	1.90	2.25	3.75
Top Yoke and Hook.....	3.00	3.75	4.50	5.50	7.50	11.00
Bottom Yoke and Hook.....	2.25	3.00	3.75	4.50	5.50	8.00
Top Pin.....	.40	.50	.50	.60	.60	.70
Bottom Pin.....	.30	.40	.40	.50	.50	.60
Regular Chain.....	10.50	12.50	17.00	21.50	27.00	36.00

Fig. 317

Each Hoist is thoroughly tested before leaving our shops

THE "HARRINGTON" IMPROVED CHAIN HOIST

Screw or Worm Geared—Two Load Chains

The worm gear, formerly of iron, is now made of bronze with square hubs, and is driven by a steel worm.

The load wheels have square holes fitted to a square hub on the worm gear, instead of clutches, thus increasing the strength and avoiding the liability of breaking. They are also reversible; when one side of the pockets becomes worn, the wheels can be taken off and turned around, bringing the good sides of the pocket into action.

The load is carried on two distinct chains, either of which has more than sufficient strength to hoist a load up to the full rated capacity of the hoist. The possibility of accident is thus greatly reduced.

The load chain hook has swivel connections, so that any twist of the chain may be straightened without removal.

A thrust screw and bronze washer are placed at the end of the worm, instantly adjustable, to obtain fast or slow speed in lowering, as is desirable in some cases.

The worm and worm gear are enclosed in a new and improved, closely fitted oil tight case or housing; the working parts are thus always immersed in oil, insuring smooth action and thorough lubrication. A hard grease of special manufacture is used for the worm and worm gear, which is better than oil and lasts longer.

A new and improved hand chain guard is so placed that the operator can stand clear of the load, without wasting labor by dragging the chain in the guard.



Style of 500 to 12,000 Capacity



Sectional View

PRICE LIST AND DIMENSIONS

Capacity in pounds	Regular Lift, in feet	Price of Hoist, Regular Lift	Price of Extra Lift, per foot	Minimum Distance Between Hooks, in inches	Weight of Hoist, in pounds	Pull on Hand Chain to Lift Full Load	Feet of Chain Handled to Lift Load, one foot	Number of Strands of Load Chain	QUANTITY OF CHAIN IN HOISTS WITH REGULAR LIFT	
									Load Chain	Hand Chain
500	8	\$ 22.50	\$1.00	14½	41	20	64.0	2	18	17
1,000	8	25.00	1.20	16	68	49	60.5	2	18¾	17
2,000	8	30.00	1.50	17	75	71	76.0	2	18¾	17
3,000	8	40.00	1.75	20	106	99	89.5	2	18¾	18
4,000	9	50.00	2.00	22	160	129	98.0	2	21	20
6,000	10	75.00	2.20	28	247	163	98.0	2	24	22
8,000	10	95.00	2.40	31	325	190	128.0	2	24	23
10,000	12	140.00	3.00	39	483	293	106.5	2	29	28
12,000	12	180.00	3.75	39	555	293	110.0	2	29	29
16,000	12	210.00	4.00	42	735	403	148.0	2	29	29
20,000	12	275.00	4.25	43	785	358	198.0	2	29	29
30,000	12	340.00	6.00	51	1,179	424	296.0	4	58	29

For Repair List See Index

THE YALE AND TOWNE "DUPLIX" CHAIN HOIST

Screw Geared

The Duplex is a popular type of double chain worm-wheel or screw block. It is very efficient and for portable use it is light and powerful, taking up little head-room.

The hand-chain guides are so placed that the operator can stand clear of the load without wasting energy in dragging the chain through the guides. The safety load-chain guides prevent slipping and the swivel connections prevent fouling of the chain. The bronze worm wheels and steel worms have hardened and ground thrust bearings and run in oil. The chain used on all blocks is made from a special grade of tough iron by a patented process which hardens it and makes the pitch of the links accurate.



Capacity in Tons	Price Complete	Regular Hoist in feet*	Extra Hoist, Price per foot	Minimum Distance between Hooks in inches	Reach in feet and inches†	Net Weight in pounds	CHAIN PULL‡	
							Lbs.	Feet
1/2	\$ 25.00	8	\$1.20	13	9'-1"	43	68	40
1	30.00	8	1.50	16	9'-4"	57	87	50
1 1/2	40.00	8	1.75	19	9'-7"	76	94	80
2	50.00	9	2.00	21	10'-9"	104	115	93
3	75.00	10	2.20	25	12'-1"	180	132	126
4	95.00	10	2.40	29	12'-5"	215	142	155
5	140.00	12	3.00	31	14'-7"	330	145	195
6	180.00	12	3.75	33	14'-9"	340	145	252
8	210.00	12	4.00	36	15'-0"	380	160	310
10	275.00	12	4.25	45	15'-9"	560	160	390

*Figures denote height in feet which blocks, with regular lengths of chain, will hoist from level on which operator stands. Extra lengths of chain should be ordered when it is desired to hoist higher. No deduction is made for blocks with less than the regular length of chain.

†The "Reach" is the sum of the "Hoist" and the "Minimum Distance between Hooks." When hung at this height to lift the full hoist above the floor, the hand chain of Triplex and Duplex blocks hangs down to within 18 inches of the floor.

‡Figures denote the pull in pounds required to lift the full load, and the number of feet of hand chain which must be handled to lift the load one foot.

YALE "TRIPLEX" SPUR-GEARED CHAIN HOISTS

For Quick Lifting and Power Saving

Capacity, $\frac{1}{4}$ to 20 Tons

The Triplex Block saves and utilizes the power which in blocks of other kinds is wasted in overcoming the friction relied on to sustain the load. Previous to this invention no block existed in which the sustaining mechanism was separated from the hoisting mechanism so that the friction of the former did not augment the resistance to be overcome in hoisting.

The hoisting mechanism consists of a balanced train of spur gears, from the small central pinion to the shrouded internal gear, of heavy pitch, constituting a part of the frame and of the full diameter of the block. The two intermediate gears are carried by a circular frame or "pinion cage," keyed to the load-chain sheave, and revolving within the internal gear, thus forming a sun-and-planet motion which gives the desired leverage.

The sustaining mechanism (see Cut 1) consists of a set of friction discs, one of which has external ratchet teeth engaging with a drop-forged pawl. The hand wheel is screwed upon the central hub, and in hoisting clamps the discs solidly together. In lowering, the reverse motion of the hand wheel releases the engagement of the discs, and allows the load to lower smoothly and rapidly, but only so long as the hand wheel is revolved backwards; when this motion ceases the discs automatically tighten and the load is securely held.

**Gear Cover Removed**

Cut steel intermediate gears. Large internal gear with large pinions and liberal wearing surfaces.

**Sectional View**

Showing steel gear cover and hand chain wheel cut open and pinion cage broken away.

Capacity in Tons	Price Complete, without Trolley	Regular Hoist in Feet	Reach in Feet and Inches	Extra Hoist Price per Foot	Minimum Distance between Hooks, in Inches	Net Weight in Lbs.	Chain Pull in Lbs. to lift Full Load	Feet of Chain Handled to lift Load one Foot
$\frac{1}{4}$	\$ 35.00	8	9 3	\$0.90	15	53	62	21
1	45.00	8	9 5	.95	17	80	82	31
$1\frac{1}{2}$	60.00	8	9 7 $\frac{1}{2}$	1.00	19 $\frac{1}{2}$	124	110	35
2	70.00	9	11 0	1.05	24	188	120	42
3	90.00	10	12 8	1.50	32	200	114	69
4	110.00	10	13 1	1.60	37	290	124	84
5	140.00	12	15 9	2.15	45	380	110	126
6	165.00	12	15 10	2.15	46	390	130	126
8	200.00	12	14 3	2.70	51	470	135	168
10	240.00	12	16 9	3.25	57	570	140	210
12	300.00	12	16 9	4.30	57	800	130†	126†
16	360.00	12	17 1	5.40	61	1,000	135†	168†
20	425.00	12	18 5	6.50	77	1,375	140†	210†

Sizes 3 to 20 tons have lower block

*Figures denote height in feet which blocks with regular lengths of chain will hoist above level on which operator stands.

†For each hand chain.

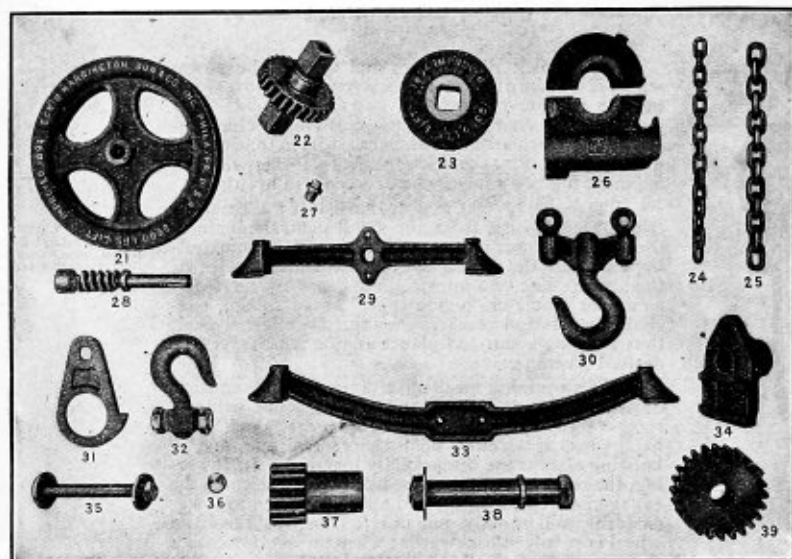
QUICK SPEED TRIPLEX HOISTS

Quick Speed Triplex Hoists handle light loads at double speed, but with double the chain pull.

$\frac{1}{4}$ Ton \$35.00 1 Ton \$45.00
For Repair List see index.

**"TRIPLEX"**

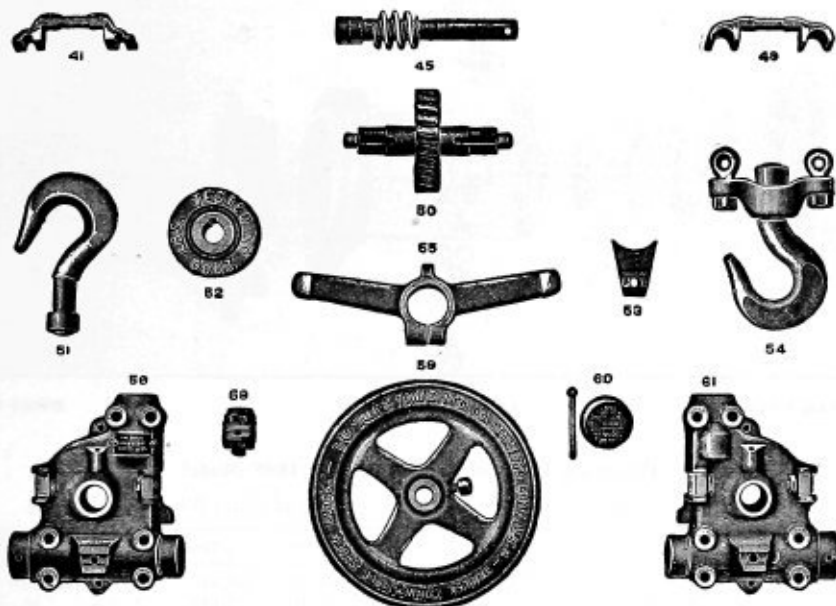
REPAIR PARTS FOR HARRINGTON IMPROVED DOUBLE CHAIN SCREW HOISTS



List No.	NAME	500	1000	2000	3000	4000	6000	8000	10000	12000	16000	20000
21	Hand Wheel	\$1.00	\$1.50	\$1.50	\$2.50	\$2.80	\$5.00	\$ 7.00	\$ 8.00	\$11.50	\$12.00	\$12.00
22	Worm Gear and Hub.....	3.00	3.20	4.00	5.00	6.00	7.00	9.00	16.00	16.00	23.00	23.00
23	Load Wheels (2).....	1.60	1.80	2.00	3.00	3.50	6.00	8.50	10.50	15.00	18.00	20.00
24	Hand Chain, per foot..	.25	.25	.25	.25	.25	.25	.30	.35	.35	.35	.35
25	Load Chain, per foot.....	.30	.35	.40	.45	.47	.50	.55	.75	.90	1.10	1.10
26	Case and Cap.....	1.50	2.00	2.50	4.00	5.50	9.50	11.00	16.00	16.00	20.00	20.00
27	Thrust Screw.....	.30	.40	.40	.50	.60	1.50	1.50	2.00	2.00	2.00	2.00
28	Worm	1.00	1.50	1.50	2.50	3.20	6.50	7.00	12.00	12.00	16.00	16.00
29	Hand Chain Guard †.....	.70	.90	.90	1.20	.....	.....	.....	.....	.....	.....	.....
30	Bottom Hook and Swivel.....	1.70	2.00	2.60	3.50	4.10	5.20	11.00	13.50	19.50	23.00	35.00
31	Side Plates (2) .....	.60	.80	.90	1.30	1.80	4.00	6.00	10.00	10.00	14.00	14.00
32	Top Hook and Swivel.....	1.70	2.00	2.60	3.50	4.10	5.20	11.00	13.50	19.50	23.00	35.00
33	Hand Chain Guard †.....	.....	.....	.....	.....	1.50	2.00	3.00	4.00	7.00	8.00	8.00
34	Gland .....	.....	.....	.....	.....	2.00	3.00	3.50	5.00	5.00	6.00	8.00
35	Center Bolt and Washers .....	.30	.40	.50	.55	.60	1.00	1.50	2.50	2.50	3.00	3.00
36	Thrust Washer.....	.20	.20	.20	.25	.30	.50	.50	1.00	1.00	1.00	1.00
37	Pinion .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.00	7.00
38	Stud .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.00	3.00
39	Gear .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.00	7.00
	Hand Chain, Regular Lift....	4.25	4.25	4.25	4.50	5.00	5.50	6.90	9.80	10.15	10.15	10.15
	Load Chains, Regular Lift with Hook and Swivel.....	7.10	8.56	10.10	11.94	13.97	17.20	24.20	35.25	45.60	54.90	66.90

†Old Style Hand Chain Guards can be furnished for this Model if desired.

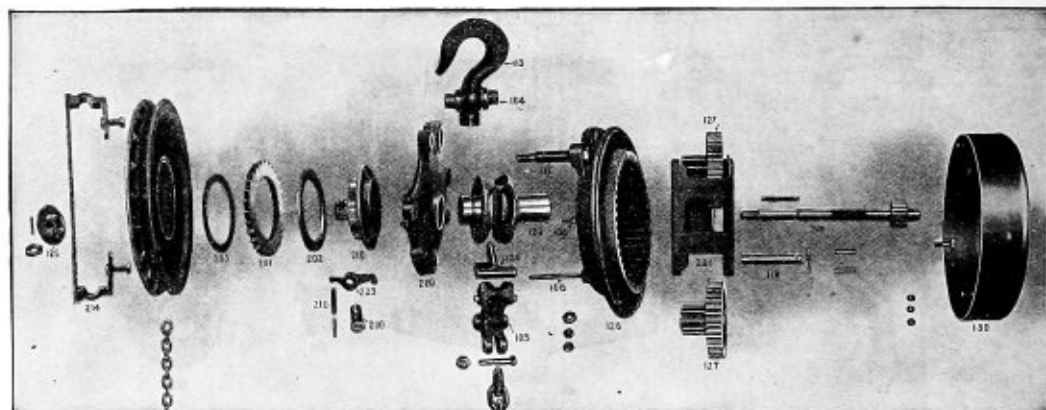
REPAIR PARTS FOR "DUPLEX" CHAIN HOISTS

Prices for Parts of Duplex Blocks, $\frac{1}{2}$ to 5 Tons*

List No.	Name	$\frac{1}{2}$ Ton	1 Ton	1½ Tons	2 Tons	3 Tons	3½ Tons	4 Tons	5 Tons	6 Tons	7 Tons	8 Tons	10 Tons
41	Load Chain Guide.....	\$0.40	\$0.50	\$0.60	\$0.70	\$1.00	\$1.20	\$1.40	\$1.60	\$1.70	\$1.80	\$1.90	\$2.50
45	Worm and Shaft.....	3.00	3.50	4.00	4.50	5.00	6.00	7.00	10.00	12.00	16.00	18.00	22.00
49	Load Chain Guard.....	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40
50	Worm Wheel.....	3.50	4.00	5.00	6.00	7.00	9.00	11.00	15.00	16.00	18.00	20.00	25.00
51	Top Hook.....	1.00	1.40	1.80	2.40	3.00	4.00	5.00	6.00	7.00	8.00	12.00	15.00
52	Load Sheave, per pair.....	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00	9.00
53	Strippers, per pair.....	.30	.40	.50	.60	.70	.80	.90	1.00	.....	.....	.....	.....
54	Bottom Hook Swivel and Eye Bolts.....	2.00	2.50	3.00	3.50	4.50	5.00	6.00	8.00	.....	.....	.....	.....
55	Hand Chain Guide.....	.90	1.00	1.30	1.80	2.00	2.40	2.60	2.80	3.00	3.00	3.00	4.00
56-61	Housing, each half.....	2.50	3.00	4.00	5.00	6.00	7.00	10.00	15.00	16.00	18.00	20.00	30.00
58	Friction Plug.....	1.20	1.40	1.70	2.00	.....	.....	.....	.....	.....	.....	.....	.....
59	Hand Wheel (see note below).....	1.50*	1.60*	2.50*	3.00*	3.50	4.00	4.50	5.00	5.00	5.00	6.50	7.00
60	Friction Plug Cover.....	.30	.30	.40	.50	.....	.....	.....	.....	.....	.....	.....	.....
72	Pinion Shaft.....	.....	.....	.....	.....	4.00	4.20	4.40	4.60	4.80	5.00	.....	6.00
74	Gear.....	.....	.....	.....	.....	1.60	1.80	2.00	2.20	2.30	2.40	2.50	3.00
91	Friction Plug Cover.....	.....	.....	.....	.....	.50	.50	.50	.50	.50	.50	.60	.60
92	Friction Plug.....	.....	.....	.....	.....	2.50	3.00	3.50	4.00	4.20	4.40	4.60	5.40
93	Hand Chain, per foot *.....	.25	.25	.25	.25	.25	.40	.40	.40	.40	.40	.40	.40
94	Load Chain, per foot.....	.37½	.40	.42½	.45	.50	.55	.55	.60	.50	.55	.55	.60
95	Bottom Guides, per pair (not shown in cut).....	.....	.....	.....	.....	.....	.....	.....	.....	4.50	5.00	6.00	7.00
96	Clevis Pin (not shown in cut).....	.....	.....	.....	.....	.....	.....	.....	.....	.50	.60	.70	1.00
97	Strippers, per pair (not shown in cut).....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	2.00	2.50	3.50
98	Bottom Hook, Swivel and Eye Bolts.....	.....	.....	.....	.....	.....	.....	.....	.....	12.00	16.00	20.00	25.00
99	Bottom Sheaves, per pair (not shown in cut).....	.....	.....	.....	.....	.....	.....	.....	.....	3.00	4.00	6.00	7.00

* In ordering Hand Wheels or Hand Chain, note number of pockets for chain links in rim of wheel.

REPAIR PARTS FOR "TRIPLEX" CHAIN HOISTS



Welded Head Chain

Load Chain

Steel Gear Cover

Prices for Parts of Triples Blocks, 1898 Model

All Blocks without "1898 Model" plainly cast on outside of Hand Wheel are old style.

List No.	Name	½ Ton	1 Ton	1 ½ Tons	2 Tons	3 Tons	4 to 20 Tons
103	Small Separator.....	\$0.40	\$0.50	\$0.60	\$0.70	\$0.60	\$0.70
104	Top Cross Head.....	1.00	1.40	2.00	2.40	.....	.....
105	Load Chain Guide.....	.30	.30	.40	.50	.40	.50
108	Load Chain Guide Bolt.....	.20	.20	.30	.40	.30	.40
112	Large Separator.....	.60	.70	.80	1.00	.80	1.00
113	Top Hook.....	1.00	1.40	1.80	2.00	.....	.....
114-5 }	Hand Chain Guides, pair.....	.75†	1.20†	1.50†	1.80†	1.50†	1.80†
119	Gear and Pinion Pins §.....	.40	.60	.70	.80	.70	.80
124	Stripper.....	.30	.40	.50	.50	.50	.50
125	Check Washer.....	.40	.50	.70	.90	.70	.90
126	Internal Gear.....	2.40	3.20	5.00	6.00	5.00	6.00
127	Gear and Pinions¶.....	.80†	1.10†	1.40†	1.60†	1.40†	1.60†
129	Load Sheave.....	1.50	2.00	2.30	2.80	2.30	2.80
130	Gear Cover.....	1.20	1.50	1.80	2.10	1.80	2.10
131	Lower Swivel Hook.....	1.50	2.30	3.20	5.50	.....	.....
200	Pawl Stud.....	.40	.40	.50	.50	.50	.50
201	Ratchet Disc.....	.80	1.00	1.40	1.50	1.40	1.50
202	Leather Disc.....	.40	.40	.50	.60	.50	.60
203	Galvanized Iron Disc.....	.40	.40	.50	.60	.50	.60
214	Strap Hand Chain Guide.....	.75†	1.20†	1.50†	1.80†	1.50†	1.80†
216	Disc Hub.....	1.80	2.30	3.20	4.20	3.20	4.20
218	Driving Pinion.....	3.00†	4.00†	5.00†	6.00†	5.00†	6.00†
220	Ratchet Case.....	2.50	3.50	4.50	5.50	4.50	5.50
221	Pinion Cage.....	1.60	2.10	3.20	4.20	3.20	4.20
223	Pawl.....	.20	.20	.30	.30	.30	.30
228	Hand Wheel.....	1.80	2.30	3.00	3.60	3.00	3.60
	Load Chain, per foot.....	.40*	.45*	.50*	.55*	.50*	.55*
	Hand Chain, Steel, per foot.....	.25	.25	.25	.25	.25	.25

* In ordering Load Chain, specify whether or not hook is required.

† The Strap Hand Chain Guide No. 214 fits in the place of Nos. 114 and 115 and should be substituted.

‡ Parts 218 and 127 should be specified "Quick Speed" for blocks so marked on the gear cover.

¶ For ½ Ton Block this is an "Intermediate Gear" instead of "Gear and Pinions."

§ For ½ Ton Block this is an "Intermediate Gear Pin" instead of "Gear and Pinion Pin."

IMPROVED AMERICAN "SAFETY" MANILA ROPE HOIST

HOLDS THE LOAD AT ANY POINT



Lock consists of only one piece which drops of its own weight on rope; two of these eccentrics in each block, one over each sheave, acting independently of each other and insuring absolute safety.

This outfit makes a cheap but efficient hoisting device which can be used to advantage in a great many places for light, occasional hoisting.

Numbers 1 to 6 consist of two double blocks.

Size No.	Price per Set of Two Blocks without Rope	Blocks Will Take Rope, Sizes	Nominal Capacity, Lbs.	One Man Can Lift About	Breaking Strain, Lbs.	Weight Per Set, Lbs.
1	\$ 2.50	$\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	600	300 lbs	1,000	24
2	4.00	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$	1,000	400 "	2,500	54
3	6.00	$\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{8}$	1,500	500 "	4,000	11½
4	9.00	$\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	2,800	600 "	6,000	20
5	12.00	$\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$	4,000	650 "	8,000	35
6	15.00	$\frac{3}{4}$, 1 , $1\frac{1}{8}$	6,000	650 "	10,000	50
7	11.00	$\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	1,700	1,000 "	5,500	17½
8	14.00	$\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$	3,000	1,100 "	8,000	30
9	18.50	$\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$	6,000	1,100 "	10,000	51
10	22.00	$\frac{3}{4}$, 1 , $1\frac{1}{8}$	8,000	1,100 "	12,000	75

The above prices do not include Manila rope, which we will furnish if desired at the market price per pound.

There are on the market some twenty or thirty grades of Manila Hemp, each grade selling at a different price; the lowest grades sell from one-quarter to one-third the price of the higher grades—but *all grades are sold*.

There is much more cheap hemp on the market than there is good hemp, but all of it is used up in the manufacture of rope or cordage of some kind.

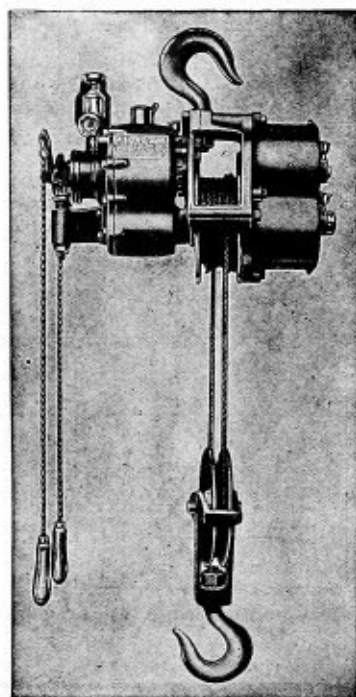
A manufacturer of rope can use all cheap hemp, all good hemp, or a mixture of good and cheap hemp. Some grades of hemp are so near alike that it is hard for one not well posted to tell the difference.

No two manufacturers of rope have the exact same cost.

The Fibre used in the manufacture of AJAX rope is a specially fine grade of long, clean white manila hemp, from the province of Cebue, Philippine Islands, every fibre of which has *Strength*.

Every buyer and user of manila rope ought to be particular when purchasing. If he wants cheap rope he should order cheap rope and pay for nothing else, but if he wants a *high grade, dependable* rope—and wants to be sure that he gets it—he should specify AJAX.





No. 2 Two Strand

PNEUMATIC GEARED HOISTS

These hoists are designed and constructed to handle loads ranging from one to ten tons to a height of 25 feet, or more, with the least possible consumption of air, and hold the load with air hose detached. Can be operated by ordinary labor.

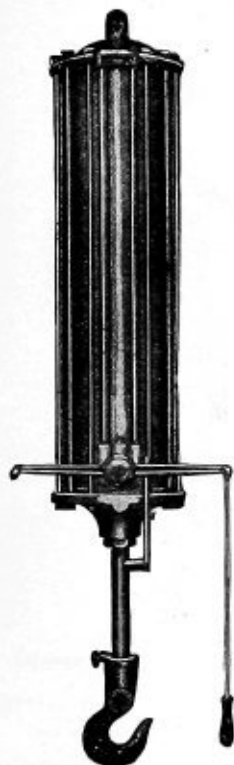
The valve is operated by two chains reaching to within five feet of the floor, and the motor may be instantly started, stopped or reversed and is self-closing when chains are released.

All parts are interchangeable, and all ordinary repairs can be made in any machine shop.

These hoists are guaranteed to stand up to test card furnished with every machine. All tests are based on 80 lbs. air pressure at motor.

Size No.	Capacity, tons	Height Lift, feet	Extra Rope Lift, per foot	Speed of Lift per Minute, feet	Shortest Distance Between Hooks, inches	Weight, pounds	Price Each
1	1	10	0.10	35	30	215	\$180.00
2	1½	10	0.20	22	38	250	} 210.00
3	2	10	0.25	16	38	250	
4	3	10	0.30	11	38	275	250.00
4½	4	10	0.30	10	38	325	275.00
5	5	12	} 0.45	10	50	565	300.00
6	6	12		9	50	720	350.00
7	{ 7	12	0.60	8	55	925	450.00
	8	12					
8	{ 9	12	0.75	6	55	1000	500.00
	10	12					

CHAMPION AIR HOISTS



Type No. 20, Large Size

This air hoist is the most advanced and practical for all classes of service to which air hoists are suitable, from the most delicate to the most severe. Its special features are all of real and practical value in actual service, and are not simply theoretical. It is economical in air consumption. It is accessible and simple. It is automatic both in lifting and in closing valve. It is safe. It is self-cleaning and self-oiling. It is adjustable both as to speed and lift. It is cushioned. It is high grade throughout.

Some of its points of merit:

Improved Adjustable Valve, combining in one body the inlet and exhaust functions, the speed adjustment, cut-off, and the safety check. Few parts; adjustable to wear; no stuffing-box.

Adjustable Speed Attachment regulates speed delicately from very slow to very fast, independently of the operating lever.

Automatic Cut-Off closes air supply at any required height, in connection with adjustable slip collar on piston rod; but at the same time allows operator to lift and lower and still have both hands free to handle his work. Saves air.

Safety Stop Device stops load from running down if air supply is broken.

Patent Exhaust Attachment. Only clean exhaust air can be drawn into top of cylinder when piston is lowering. Shuts out dirt and grit. Saves piston packing. We have exclusive use of this device.

Automatic Lubrication both of valve and piston rod. Oil placed in top of hoist lubricates the piston, and surplus oil is drained down to piston rod stuffing-box.

Accessible Design. Valve can be removed without removing heads and without unscrewing the inlet or exhaust pipes. No "screwed on" heads used; all heads removable by simply taking off a few nuts. Through rods from top to bottom strengthen the machine.

Cushioned Stop at top and bottom of cylinder prevents sudden stops and jars.

Universal Hook. Ball and socket type easily removable.

Polished Cylinder inside, insuring high efficiency; die pressed piston packing; brass piston rod gland.

Self-Closing Valves are supplied when specially ordered, but are not suited to some duties.

BALANCED AIR HOISTS are sometimes desired for certain classes of work, and our Type No. 20 hoist may have the balanced air valve attachment at slightly increased cost. For usual service the balanced feature is not necessary.

Inside Diameter of Cylinder	LIFTING CAPACITIES AT VARIOUS AIR PRESSURES (ACTUAL) IN POUNDS			APPROXIMATE SHIPPING WEIGHT, PACKED		Cubic Feet Free Air used per ft. of Lift at 60 lbs.	PRICES		Price per Foot Additional Lift over 4 ft. up to 8 ft.
	At 60 lbs.	At 80 lbs.	At 100 lbs.	4 ft. Lift	Per Foot Additional		Type No. 10 4 ft. Lift	Champion Type No. 20 4 foot Lift	
3 in.	380	510	630	118 lbs.	10 lbs.	.30	\$ 35.00	\$ 40.00	\$ 4.50
4 "	680	900	1,130	160 "	20 "	.45	38.00	43.00	5.00
5 "	1,060	1,410	1,770	180 "	25 "	.68	45.00	50.00	5.50
6 "	1,530	2,040	2,540	240 "	31 "	.99	55.00	60.00	6.00
7 "	2,080	2,770	3,460	390 "	82 "	1.36	68.00	73.00	7.00
8 "	2,710	3,620	4,520	470 "	101 "	1.75	71.00	76.00	8.00
10 "	4,250	5,660	7,080	760 "	140 "	2.77	95.00	100.00	10.00
12 "	6,160	8,220	10,280	900 "	160 "	3.99	130.00	135.00	13.50
14 "	8,310	11,080	13,850	1,040 "	200 "	5.42	158.00	165.00	16.00
16 "	10,860	14,480	18,100	1,440 "	260 "	6.91	203.00	210.00	18.00
20 "	16,960	22,620	28,200	2,200 "	360 "	11.10	283.00	290.00	23.00
24 "	24,430	32,570	40,720	3,050 "	410 "	15.80	380.00	390.00	36.00

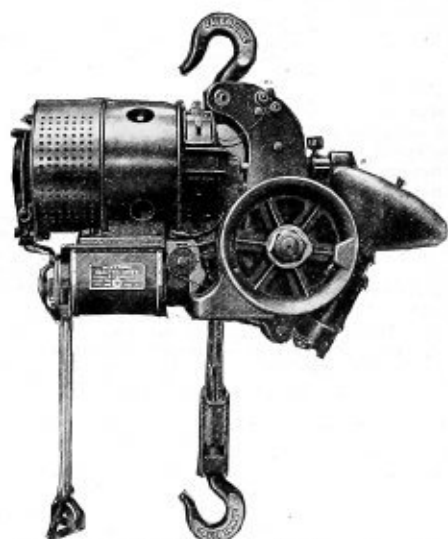
ALL HOISTS OVER 8 FT. STROKE TAKE SPECIAL PRICES

TYPE No. 10 AIR HOIST

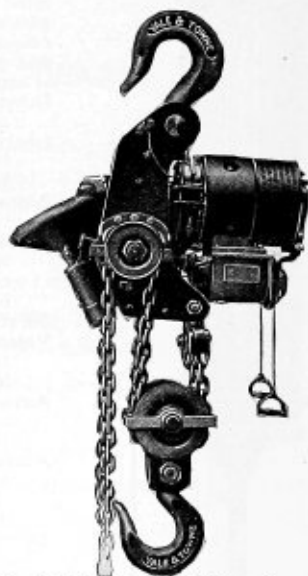
Type No. 10 Air Hoist, although a cheaper type, is not the ordinary "plain hoist" generally supplied, but has a number of improvements which enables it to rank with many of the "best" types on the market. The same quality of construction and workmanship is maintained as on Type No. 20 hoist. It has the patent exhaust attachment—the adjustable speed device and universal hook; but various parts used on No. 20 and not essential on many classes of plain work, are omitted. This hoist is similar in appearance to the Type No. 20, with the automatic cut-off omitted.

YALE AND TOWNE ELECTRIC HOISTS

For Direct Current, 110 to 650 Volts



Wire Rope Hoists, 1, 2 and 5 Tons Capacity



Chain Hoists, 8 and 12 Tons Capacity

These are high grade Machines designed to give uninterrupted service and operate at minimum cost. The hoist consists of two winding drums, hung in steel suspension plates and driven by direct current crane motor.

The rheostat is fan cooled and controller is provided with a large number of contacts arranged to give gradual speed acceleration, all parts are easily accessible and any workman of ordinary intelligence can operate the hoist. Installation involves simply hooking up the hoist and connecting two wires for current.

Magnetic blow-out coils are provided and automatic stops are on hoisting and lowering limits of hook travel

The gears run in a bath of oil and journals are equipped with compression grease cups. All parts are enclosed and protected against heat, dust and moisture.

SPECIFICATIONS AND PRICES

No.	Capacity, tons	H. P. of Motor	Reg. Lift, feet	Max. Lift, feet	Minimum Distance Between Hooks, ins.	SPEED IN FEET PER MINUTE		Number of Parts of Hoisting Rope	Weight, pounds	Price with Reg. 10-foot Lift
						Loaded	Light			
86	1	3	10	45	40	20	25	Wire 2 parts	640	\$ 400.00
87	2	3	10	45	40	15	25	" 2 "	640	415.00
88	4	3	10	22	53	7	14	" 4 "	820	450.00
89	5	7	10	45	61	15	25	" 2 "	1,560	700.00
90	6	3	10	15	62	5	9	" 6 "	870	485.00
91	8	3	10	any	52	3 1/2	.....	Chain 4 "	886	600.00
92	10	7	10	22	78	7	14	Wire 4 "	1,800	950.00
93	12	7	10	any	88	3 1/2	.....	Chain 4 "	2,300	1400.00
94	15	7	10	15	99	5	9	Wire 6 "	2,000	1150.00

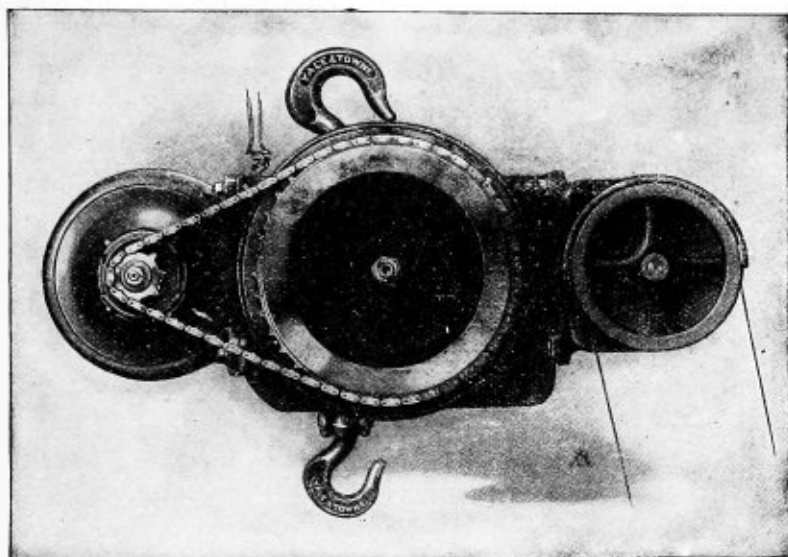
The 8 and 12 ton are chain hoists, the height of lift is governed only by length of chain, extra lift add \$3.00 and \$5.00 per foot.

Longer drums for maximum lift add for 1, 2 and 4 ton, \$25.00, 6 ton, \$40.00; 5, 10 and 15 ton \$50.00 extra.

Foundry type controller, with 5 hoisting and 4 lowering speeds, \$75.00 extra.

YALE & TOWNE ELECTRIC TRIPLEX HOIST

For Direct Current Only. Any Voltage



This Electric Hoist solves the problem of short, frequent lifts of from 50 to 2,000 lbs. The Hoist is light, compact and simple. It may be hooked to any overhead support and requires little head-room.

For handling packages, serving machine tools, running on trolley tracks, attaching to small traveling cranes, lashing to sheer poles, or temporary rigs, this Hoist takes the place of a chain block at a moderate additional cost and gives from five to ten times the speed. There are many places in every shop where the Electric Triplex is exactly what is wanted.

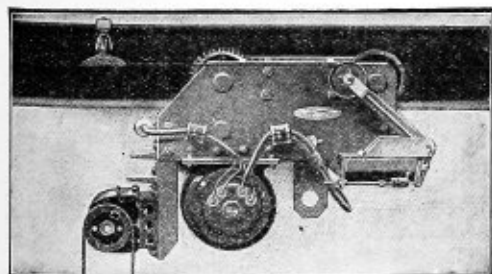
While designed primarily for moderate service, and short lifts, a recent test consisted of raising a one ton load, 10 feet high and lowering for 40 operations, within a period of two hours. This is harder service than the Hoist should be required to stand but it did not injure the machine.

The installation involves simply hooking up, and attaching two wires for current. The controller is operated by two pendant cords. The lifting speeds are from 12 to 30 feet per minute.

Capacity in Tons	Nominal H.P. of Motors	Speed, feet Per Minute	DIMENSIONS			Weight, lbs.	Price, 8 ft. Lift	Extra Lift, per foot
			Min. Dist. between Hooks, inches	Width Over all, inches	Length Over all, inches			
1/2	1/2	12-30	18	17	32	250	\$225.00	\$0.80
1	3/4	12-30	22	18	35	400	300.00	.90

MOTOR-DRIVEN TROLLEYS

To Run on Lower Flange of Single I-Beam



These trolleys are attached to electric hoists when both power hoisting and traveling are required. They develop a speed of 350 feet per minute fully loaded, thus enabling one man to hoist and convey a large tonnage of material in a day.

Capacity, tons.....	1	2	3	4	5	6	8	10	12	15
Size of I-Beam, inches.....	8	8	10	10	15	15	20	20	20	20
Min. Radius of Curves, ft.....	10	10	12	12	12	12	15	15	15	15
Price, Complete.....	\$500.00	500.00	600.00	600.00	750.00	750.00	950.00	975.00	1,250.00	1,250.00

SPRAGUE ELECTRIC HOISTS

Capacity 1-2 to 6 tons.



**S-1 Hoist with Style A Plain
Trolley Carriage and Single
Speed Controller**

Standard hoists are spur-gear, but worm-gear can be furnished where high speeds are not desired.

Spur-gear hoists are equipped with automatic brakes which hold loads absolutely at any point, whether or not hoist is supplied with current.

Hoists can be equipped with either single speed controller for quick handling of loads or with rheostatic or foundry type controller where extreme accuracy is required in handling the load.

All hoists are fitted with automatic limit switch, which absolutely prevents damage to hoist through running the hook too high.

Spur-gear hoists, 2 to 6 ton capacity, have also a lowering limit switch.

Illustration shows hoist with style A carriage for running on lower flange of single I-beam. Hoist can also be furnished with carriage for running on upper flange of single I-beam or with carriage for running on top of double beams for bridge cranes.

Carriages can be furnished plain, hand geared or motor driven, also with cage for operator.

All hoists have enclosed motors designed especially for the purpose; all working parts are entirely enclosed and hoists may be used in dusty places or outdoors.

SPEEDS, LOADS, WEIGHTS AND LIFTS OF STANDARD HOISTS AND TROLLEY CARRIAGES

Hoist No.	Hoisting Speed Maximum Load Ft. per Minute	Maximum Load, Tons	Chain or Rope	Approximate Weight in Lbs. of Hoist without Carriage	APPROXIMATE WEIGHT IN LBS. OF HOIST AND CARRIAGE						Maximum Lift in Ft. Using Standard Drums
					STYLE A			STYLE C			
					Plain	Hand Geared	Motor Driven	Plain	Hand Geared	Motor Driven	
S1	30	1½	1 rope	450	531	650	800	.....	.....	.....	30
	15	1	2 "	450	531	650	800	.....	.....	.....	15
W1	40	1½	2 ropes	475	730	875	1,000	795	.....	.....	30
	20	1	2 "	475	730	875	1,000	795	.....	.....	30
	10	2	2 chains	465	720	865	990	785	.....	.....	15
	10	2	4 ropes	535	790	935	1,070	855	.....	.....	15
W2	52	¾	2 ropes	660	915	1,210	1,185	980	1,135	1,290	50
	26	1½	2 "	660	915	1,210	1,185	980	1,135	1,290	50
	13	3	2 chains	710	965	1,210	1,242	1,030	1,185	1,340	25
	13	3	4 ropes	760	1,015	1,210	1,292	1,080	1,235	1,390	25
S2	35	2	2 ropes	1,250	1,550	1,620	1,700	1,700	1,900	2,200	32
	23	3	3 "	1,250	1,550	1,620	1,700	1,700	1,900	2,200	23
	17	4	4 "	1,250	1,550	1,620	1,700	1,700	1,900	2,200	16
S3	50	3	2 ropes	1,600	2,050	2,200	2,300	2,200	2,400	2,900	50
	36	4½	3 "	1,600	2,050	2,200	2,300	2,200	2,400	2,900	33
	22	6	4 "	1,600	2,050	2,200	2,300	2,200	2,400	3,000	25

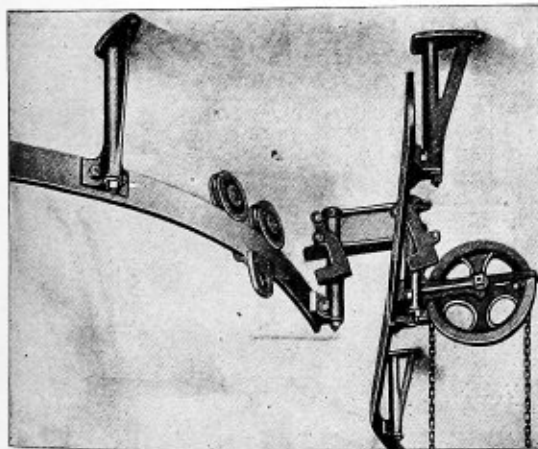
CHANNON FLAT TRACK OVERHEAD TROLLEY SYSTEMS



In connection with portable chain hoists, overhead tracks, either flat bars or I-beams, are used to great advantage in the quick and easy handling of heavy material in machine shops, foundries, mines, boiler shops, and in warehouses for handling and piling up high, packages which could not otherwise be easily moved or elevated.

Our shops are prepared to furnish promptly tracks, either flat bar or I-beams, straight or bent, with two or three way switches, turntables, hangers, trolleys, bolts, splices; in fact, everything necessary.

In asking for estimates be sure and state style of tracks, maximum load to be handled, where long hangers are required give the distance between overhead timber and trolley wheels clearing all obstructions, state length of track, whether straight or curved, if the latter send sketch and give radius and location of curves, etc.



OVERHEAD SWITCH WITH SAFETY STOPS

A very desirable arrangement for transferring the load from one track to another, so that a load, when once raised, can be carried to any desired point without rehandling. The switch consists of a rail moved by an eccentric jointed lever, which is worked by chain wheel and pendant chain.

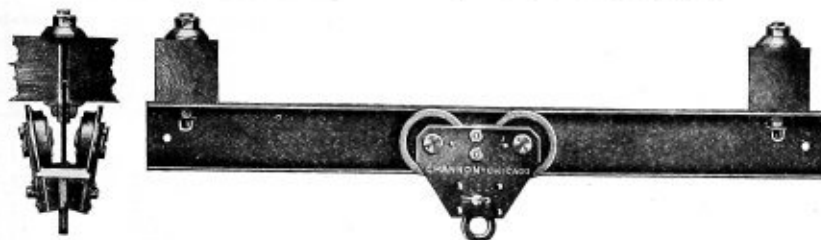
The movable rail has at all times a firm support, whether in line with either fixed rail, or stopped at any point between the two, and when in line with either rail, is securely locked in position. The rails being fitted with automatic stops, the load cannot run off when switch is open.

Send sketch showing line of track, height of ceiling, and location of switch.

Price.....\$55.00

View From Below

CHANNON I-BEAM TROLLEY SYSTEMS

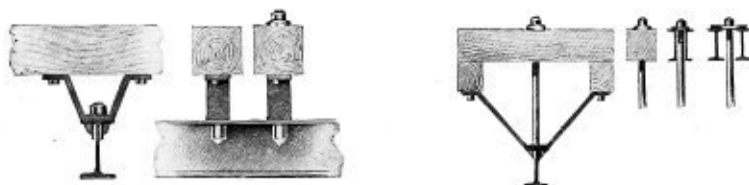


This is the safest and most substantial form of overhead track. By use of the trolleys running on the lower flanges of the I-beam the head room occupied is as small as possible.

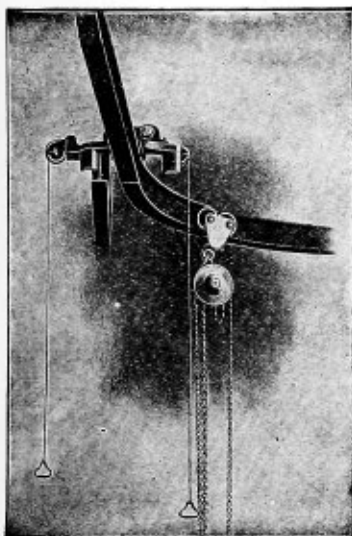
The strength and lateral stiffness of I-beams is so great that fewer supports are required, making it easy to erect them.

The beams may be suspended by bolting direct to the timbers or by means of hanger bolts keyed to the I-beams or by clips.

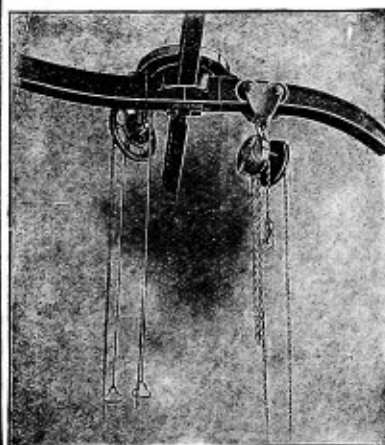
HANGERS



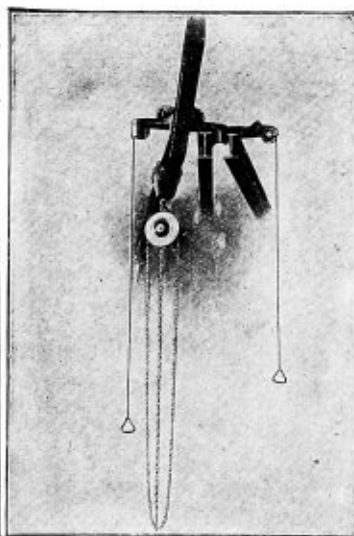
SWITCHES AND TURNABLES



Single Switch



Turntable



Double Switch

They are operated from the floor by pulling on pendant hand chains shown, and can be used with absolute safety, as they are so arranged that the trolley cannot run off the rail under any conditions of use. For prices, see other page.

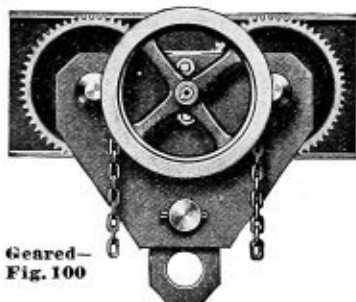
CHANNON FOUR-WHEEL I BEAM TROLLEYS

For Lower Flanges of I Beams

All wheels fitted with our self-lubricating graphite-bronze bearings, which require no oil or attention and save 5 per cent in loss of power by friction on each wheel.



Plain—Fig. 98

Geared—
Fig. 100

Capacity in Tons	Standard Size of I Beam, inches	Greatest Distance between Supports, Feet	Smallest Radius, I Beam Curve, inches	Plain—Fig. 98			Geared—Fig. 100		
				Price Each	Approximate Weight, Lbs.	Direct Pull to Start, Loaded, in Lbs.	Price Each	Approximate Weight, Lbs.	Direct Pull to Start, Loaded, in Lbs.
$\frac{1}{4}$	4	14	18	\$ 18.00	30	23	\$ . . . . .	. . . . .	. . . . .
$\frac{1}{2}$	5	14	21	20.00	35	26	. . . . .	. . . . .	. . . . .
1	6	13	21	25.00	55	47	55.00	100	15
$1\frac{1}{2}$	7	13	34	35.00	100	65	60.00	150	24
2	8	13	36	40.00	125	74	65.00	175	23
3	9	13	42	50.00	150	106	70.00	195	30
4	10	13	48	60.00	225	145	100.00	325	45
5	12	15	54	80.00	325	60	110.00	375	55
6	15	18	66	120.00	550	70	160.00	625	23
8	20	25	66	140.00	600	90	170.00	675	28
10	24	27	66	150.00	650	115	190.00	700	35

Can be made for any size beams.

Geared trolleys include hand chain and sprocket wheel for racking from floor.

In ordering, be sure to give size and weight of beam.

STEEL YOKE TROLLEYS

Four Steel Roller Bushed Wheels

No.	2	3	4	6	8	10
Cap lbs.	2000	3000	4000	6000	8000	10000
Fig. 112	\$32.00	\$34.00	\$36.00	\$43.00	\$48.00	\$53.00
Fig. 113	21.00	22.50	24.00	28.00	32.00	36.00

The geared trolley has hand chain and sprocket wheel for racking from floor.

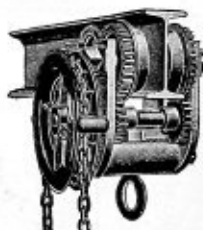


Fig. 112—Geared



Fig. 113—Plain

FIG. 117—MALLEABLE FRAME TROLLEYS

A light easy working Trolley for 5 to 7 inch I Beams. Has four wheels Steel Roller Bushed



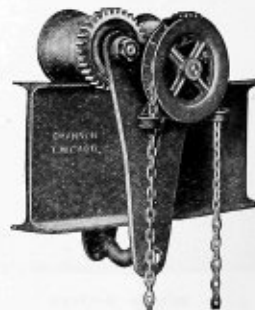
Number	Capacity, lbs.	Price
01	1000	\$15.00
02	2000	18.00
03	4000	21.00

FIG. 118—TROLLEYS FOR TOPS OF I BEAMS

With two wheels or drums for top Flange cut shows Geared Trolley

Capacity, lbs.	1000	2000	3000	4000	6000	8000	10000
For I Beams	5	6	7	8	9	10	12
Price, Plain	\$30.00	\$35.00	\$35.00	\$35.00	\$40.00	\$40.00	\$45.00
" Geared	45.00	50.00	50.00	55.00	60.00	60.00	65.00

In ordering Trolleys be sure and state size and weight of I Beam



EXPANSION ROLLER-BEARING BARN DOOR HANGER



No. 27. Suitable for Light Work

No. 2 hangers lateral and vertical adjustment, per pair...\$4.50
Extra brackets, each......20
No. 31 trolley track, per foot......25

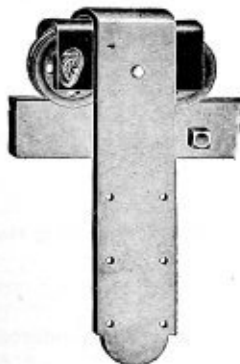
No. 29. Suitable for Heavy Work

No. 2 hangers with lateral and vertical adjustment, per pair.....\$5.50
No. 232 track, No. 14 gauge, per foot......40
Brackets for track, end or center, each......40

No. 123. Suitable for Extra Heavy Work

No. 2, with lateral and vertical adjustment, per pair....\$6.50
No. 33 track, per foot......60
Brackets, each......50

ROLLER-BEARING BARN AND WARE- HOUSE HANGER No. 44



Runs on all standard rails. Made in four sizes and to suit doors of any size or weight. Nos. 1 and 2 packed one dozen pairs in a crate; Nos. 2½ and 3 packed one-half dozen pairs in a crate.

No.	Pendants	Wheels	Price per dozen pairs	Price per pair
1	14x2¼x⅝ in.	3¼ in. in dia.	\$20.00	\$2.00
2	16x3¼x⅝ in.	3¾ in. in dia.	30.00	3.00
2½	22x3¼x⅝ in.	4 in. in dia.	50.00	5.00
3	22x3½x⅝ in.	4¼ in. in dia.	70.00	7.00

MODERN STEEL BARN DOOR RAIL



	Inches	Weight, Lbs.	Price
No. 61, per 100 feet	1 x ⅞	70 pounds	\$ 7.50
No. 68, per 100 feet	1 ½ x 1 ¼	100 pounds	10.50

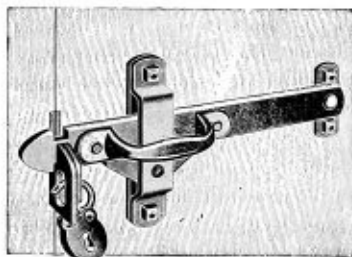
STEEL BARN DOOR STAY ROLLER No. 54



Wheel is covered. Commonly used in freight houses, box stall and on all inside sliding doors where stay can be attached to floor. Packed one dozen in a box, complete with twelve 5x½ inch lag bolts.

Price, per dozen.....\$5.00
Price, each......50

SLIDING DOOR LATCH No. 126



Operated from either side of door.

For swinging or sliding doors. Length of latch 13 inches, width 1½ inches, thickness, ⅝ inch. For right or left doors. Combination lock and latch. Adjustable for doors of varying thickness. Weight, per dozen, sixty-five pounds. Packed one dozen sets in a box.

Per dozen.....\$12.00
Price, each......1.20

SINGLE AND DOUBLE BEAM HAND POWER TRAVELING CRANES

Capacity, 1-2 to 10 tons.

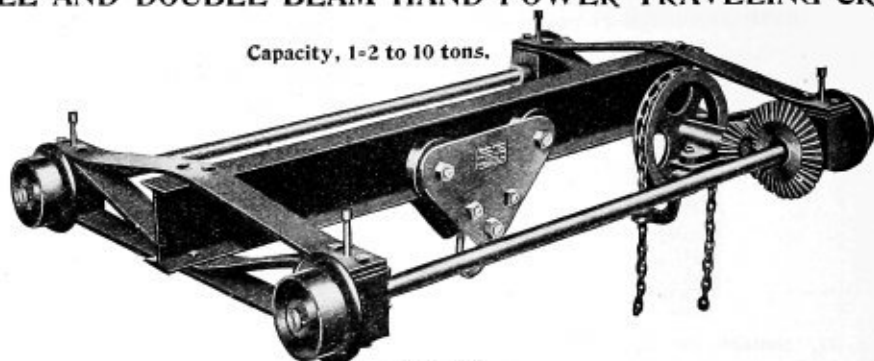


Fig. 1017

Single I Beam Traveler

Can be furnished with one or two trolleys, plain or geared, and either with or without hand chain and wheel for racking or propelling from floor. The ends of beam show cast supports on side for side or bridge travel. These are more often constructed of steel bars or channels well braced.



Fig. 1028

Geared Double I Beam Bridge Steel Truck Ends, Hand Chain and Wheel for Racking Geared Trolley

All cranes work freely without jar or vibration; wheels have our self-lubricating graphite-bronze bearings, which require no oil or attention.

Bridge for short spans of light loads, made of single I-beam, for long spans, reinforced with channel on top of beam, as shown in top cut.

The double beam cranes have twice the capacity of single and may be safely made much longer span on account of boxlike girder formed by the two beams giving great rigidity.

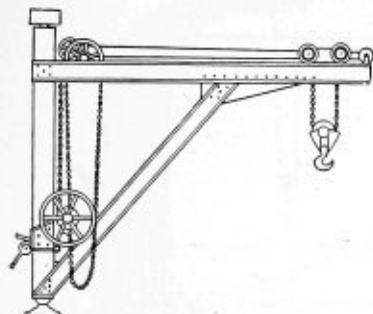
Trolleys and chain hoists may be furnished of any type listed previously. The geared trolleys have hand chain for racking from floor.

Track for bridge travel may be of steel T-rails, channels or I-beams. Can furnish track also with splices and bolts if desired.

Be sure and state maximum capacity, length of span center to center of track, exact height from floor to track and style of crane trolley and hoist wanted.

We are prepared to furnish promptly special cranes of any description or power.

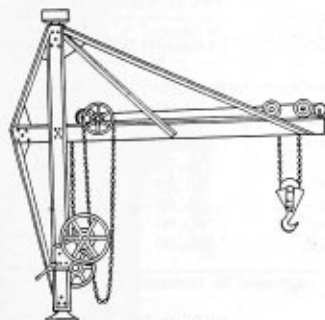
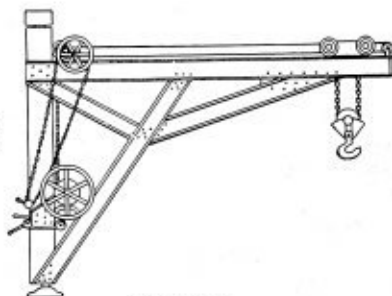
JIB CRANES

**TYPE A****SINGLE BRACED JIB CRANES**

Usually the single braced jib (type A) can be constructed at a lower cost than any other type. It represents the simplest form of jib crane and is adaptable in nearly all locations.

TRIPLE BRACED JIB CRANES

The triple braced frame is most suitable for locations requiring ample clearance under the jib and proportionately large radius of jib.

**TYPE C****TYPE B****TOP BRACED JIB CRANES**

The top braced jib is adapted to high ceilings and to yard use. It possesses the advantage of a perfectly clear space under the jib. This type cannot be advantageously used where ceiling is low unless the jib is comparatively short.

Give capacity, height of mast, length of jib, type of frame, most available power, and class of work.

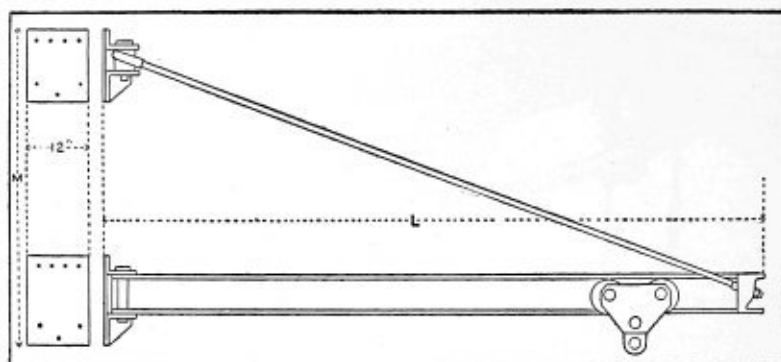
We illustrate above the various types of jib cranes. They may be operated by hand or steam power, electricity or compressed air. The frames—including mast, jib and brace members—are constructed of structural steel shapes and plates, properly fitted and connected to frame castings. Both top and bottom mast head castings, which are attached to frame members, are fitted with steel pins, the bottom pin resting on crowned anti-friction steel washers. The foundation plate and top pin support are made of cast iron.

Hand power jib cranes are equipped with both hoisting and trolley racking gearing, which are operated respectively by hand cranks and pendant hand chain from a point on the floor near the mast. The hoisting gear is arranged for two speeds, for heavy and light loads, and consists of heavy spur gears driving a grooved drum of sufficient size to take, without overlapping, the necessary length of hoisting chain or wire rope. An improved automatic brake places the load under complete control at any point of the lift and prevents flying back of handles. The loads are lowered by brake under perfect control of hand lever. Hand cranks are made of steel and provided with machined "spool type" handles. Gear guards are furnished, protecting operators from accident.

Only spur gearing is used and all bearings are babbitted. Shafting and axles throughout are steel and all parts are standard. When desired the frame may be made of timber with heavy castings for top and bottom of mast and for end of jib.

Top pin bearing bolts to side of supporting beam, but may be arranged to be attached underneath if so ordered.

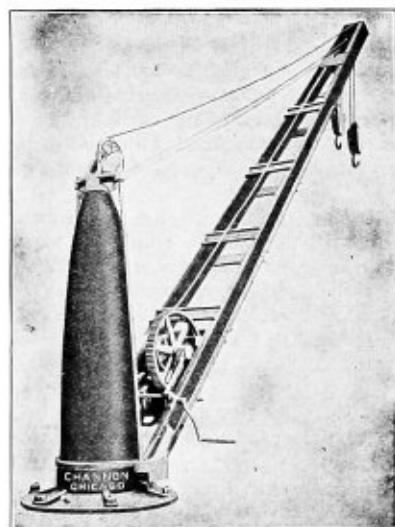
SWINGING BRACKET JIB CRANES



These cranes may be attached to walls, columns or similar locations, and are available in machine shops for serving tools, in boiler shops and blacksmith shops. The frame is steel, the trolley free on jib, and the hoisting gearing, either chain block or free hoist, mounted in trolley or suspended from it.

Capacity in Tons	DIMENSIONS		Size of I-Beam	Weight with- out Trolley	PRICES WITHOUT HOISTS	
	Length of Jib	Height of Brace			Without Trolley	With Steel Plate Trolley
1	11 ft. 6 in.	5 ft. 3½ in.	8 in.—18, lb.	440 lbs.	\$ 65.00	\$ 90.00
1	13 " 11 "	5 " 3½ "	8 " —18, "	505 "	70.00	95.00
1	16 " 5 "	6 " 3½ "	8 " —18, "	565 "	75.00	100.00
2	11 " 7 "	5 " 3½ "	8 " —18, "	460 "	70.00	110.00
2	14 " 1 "	5 " 3½ "	8 " —18, "	525 "	75.00	115.00
2	16 " 7 "	6 " 3½ "	9 " —21, "	645 "	80.00	120.00
3	11 " 0 "	6 " 3½ "	9 " —21, "	525 "	75.00	125.00
3	14 " 7 "	6 " 3½ "	9 ft.—21, "	600 "	80.00	130.00
3	16 " 8 "	7 " 4½ "	10 " —25, "	750 "	105.00	155.00

The Hinge plates will be drilled only when sketch giving location of holes is furnished.



HAND POWER PILLAR CRANES

These cranes are extensively used by railroads and on docks for locations where a top support is not available. We make them in a variety of designs, with and without auxiliary or whip hoists. The pillar is made of either iron or steel, as conditions require.

They may be made for operation by hand power or by electric power, or, in some cases, by direct acting air hoists. The straight boom is standard.

HAND POWER LIST

Standard capacities, 2, 3, 5, 7½, 10 and 15 tons

Standard radius, 15 feet.

Special radii to order, 10, 12, 15, 20 feet.

The cut shows double block design with auxiliary power whip hoist. The standard type has only one block.

CHAMPION PORTABLE SHOP CRANE

Furnished with regular or "Flat" Bed Plate 12 inches in height or "Low Down" Bed Plate 6½ inches high, permitting crane to run under machines.

The body of the crane base, wheels and projecting arms are of cast iron, the front axle is cast steel; a wide, heavy band of wrought iron reinforces the projecting arms and is bolted through the hook plates and extends through the base.



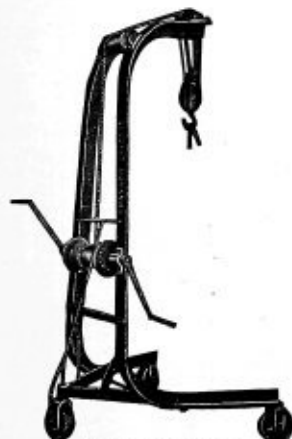
With Low Down Bed Plate

No.	Cap., Tons	Height of Hoist	Overhang, inches	SIZE OF BED, INCHES			Wt., Lbs.	Price, each
				Width, Inside	Width, Outside	Length		
0	¾	4' 8½"	28½	32	24	38	550	\$100.00
1	1½	5' 5"	28½	32	24	38	665	100.00
2	2	6' 8"	31½	34	26	43	800	112.50
3	2½	7' 10"	32½	38	30	48	1,000	125.00
4	3	8' 8"	35	50	31	48	1,150	150.00
5	2½	8' 11"	48	51	42	60	1,325	200.00

Specify whether "Flat" or "Low Down" Bed Plate is desired.

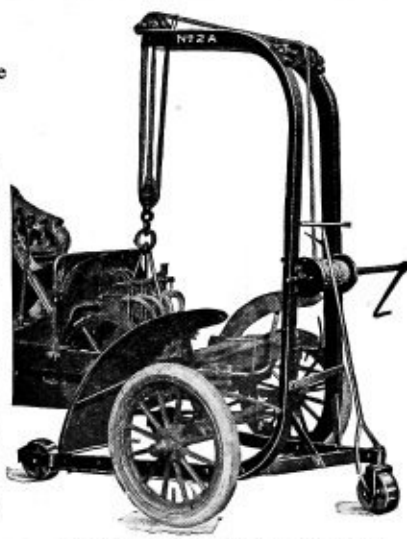
HERCULES PORTABLE SHOP CRANE

Steel Frame, Roller Bearing Wheels, Manila Rope Tackle

Regular Pattern
Nos. 1, 2 and 3

The load is picked up by one man and transported to desired location. Very useful for serving machine tools.

No.	Capacity, Lbs.	Approx. Weight, Lbs.	Price
1	1,000	275	\$57.00
2	2,000	340	72.00
3	3,000	420	88.00
2A	1,000	390	82.00
3A	2,000	485	97.00

Automobile Low Down Pattern
Nos. 2A and 3A

DIMENSIONS OF No. 1, 2 AND 3

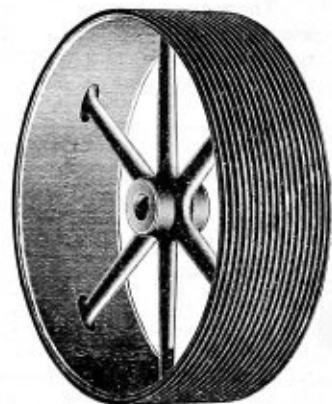
Height, over all.....	8 feet	
Hoist.....	6 feet	9 inches
Width of bed, outside.....	4 feet	3 inches
Width of bed, inside.....	3 feet	5 inches
Length of bed, outside.....	4 feet	
Length of bed, inside.....	2 feet	6 inches
Height of bed.....	12 inches	
Overhang.....	1 foot	11 inches
Wheels.....	7½ inches in diameter,	3-inch face

DIMENSIONS OF No. 2A AND 3A

Height, over all.....	8 feet	
Hoist.....	6 feet	6 inches
Overhang.....	3 feet	
Height of bed.....		7½ inches
Width of bed, outside.....		45 inches
Width of bed, inside.....		36 inches
Length of bed, outside.....	6 feet	
Length of bed, inside.....	3 feet	6 inches

IRON SHEAVES FOR MANILA ROPE TRANSMISSION

Accurately Turned, Balanced, Bored and Painted, With Set Screws or Key Seats

The Prices Listed Below Are for Sheaves for $\frac{3}{4}$ -inch, $\frac{7}{8}$ -inch and 1-inch Rope

Diameter, inches	NUMBER OF GROOVES																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	18		
12	7.90	9.95	12.75	14.80	16.15	18.35	20.40	22.65	24.90	26.35	28.15	30.10						
14	9.50	11.15	13.45	15.60	17.25	19.15	21.85	23.60	25.20	27.55	29.15	31.35						
16	10.15	12.35	14.20	16.75	18.90	20.65	22.10	24.75	26.15	28.80	30.20	32.45	34.60	36.75	40.15			
18	11.50	15.60	17.15	20.75	23.25	26.90	29.85	32.25	35.15	38.45	41.50	44.15	47.20	50.80	60.75			
20	12.50	16.90	21.20	25.80	30.40	35.10	40.00	44.90	50.00	55.40	60.80	66.60	72.70	79.10	91.50	103.90		
22	13.60	18.20	22.90	27.80	32.80	37.90	43.20	48.60	54.10	59.90	65.90	72.00	78.60	85.20	98.40	111.50		
24	14.60	19.70	24.80	30.00	35.40	40.80	46.60	52.50	58.30	64.60	70.90	77.50	84.40	91.60	106.00	120.40		
26	15.80	21.10	26.60	32.30	37.90	43.80	49.90	55.20	62.60	69.20	76.10	83.20	90.60	98.40	113.60	128.80		
28	17.00	22.70	28.60	34.60	40.70	46.90	53.40	60.10	66.00	74.00	81.40	88.90	96.70	104.90	121.30	137.70		
30	18.40	24.50	30.60	37.00	43.60	50.20	57.10	64.10	71.30	78.70	86.40	94.30	102.60	111.20	128.40	145.60		
32	19.70	26.20	32.90	39.60	46.20	53.80	61.20	68.80	76.60	84.70	93.00	101.50	110.70	120.30	138.70	157.10		
34	21.10	28.10	35.20	42.40	49.80	57.50	65.70	73.40	81.70	90.40	99.10	108.20	117.60	127.30	146.70	166.10		
36	22.70	29.90	37.30	45.00	52.80	60.80	69.10	77.60	86.52	95.50	104.80	114.40	124.50	135.10	155.50	175.90		
40	25.50	34.10	42.50	51.10	59.90	68.90	78.20	87.80	97.70	107.80	118.20	128.90	140.50	152.10	175.10	198.10		
44	29.50	38.80	48.10	57.50	67.80	77.90	88.30	99.10	110.20	121.60	133.20	145.20	157.80	170.60	196.20	221.80		
48	33.60	43.80	54.20	64.80	75.70	87.00	98.50	110.40	122.40	135.00	147.80	161.00	175.20	190.40	219.00	247.60		
52	38.20	49.60	61.10	72.80	85.00	97.20	110.00	123.10	136.40	150.20	164.40	178.80	194.10	209.80	241.80	273.80		
56	43.80	56.30	69.60	82.10	95.10	109.10	123.10	137.50	152.50	167.30	183.00	198.90	215.40	232.50	267.50	302.50		
60	50.20	63.80	77.90	92.20	106.80	121.90	137.20	153.10	169.30	186.00	202.90	220.40	238.50	257.80	295.40	334.00		
64	56.90	71.90	87.20	103.00	119.00	135.50	152.30	169.60	187.00	205.40	223.90	243.00	264.80	286.20	328.20	370.20		
68	64.40	81.00	97.90	115.10	132.70	150.80	169.20	188.30	207.60	227.40	247.70	268.40	289.60	312.20	357.20	402.20		
72	73.10	91.20	109.80	128.60	148.10	167.80	188.50	208.70	229.80	251.50	273.60	296.20	319.60	344.20	388.70	436.70		

ADVANCE THE ABOVE LIST PRICES

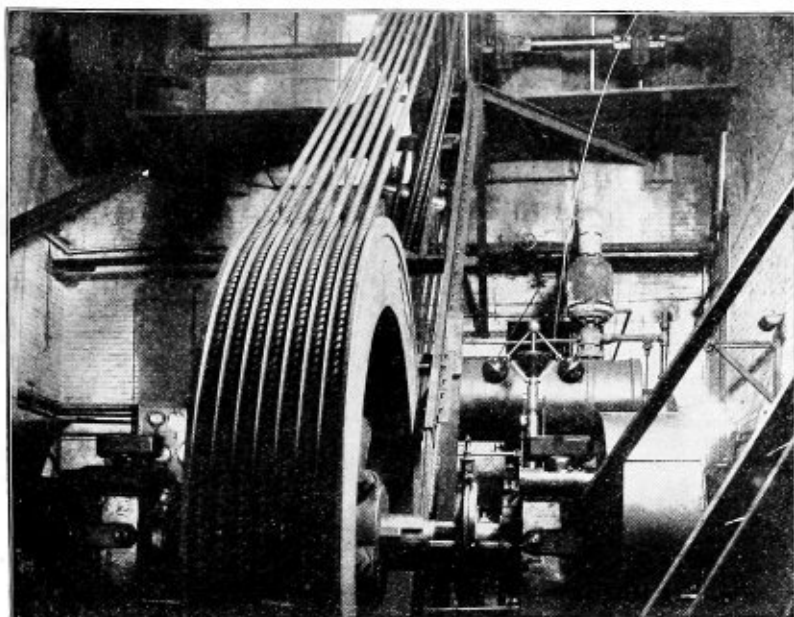
10 per cent for $1\frac{1}{4}$ -inch Rope.
15 " " " $1\frac{3}{4}$ " "25 per cent for $1\frac{3}{8}$ -inch Rope.
30 " " " $1\frac{1}{2}$ " "50 per cent for $1\frac{3}{4}$ -inch Rope.
75 " " " 2 " "

SHEAVES ARE MADE TO ORDER ONLY

Always Specify Bore, Diameter, Number of Grooves and Size of Rope and Whether KS, SS or Both

Where hard work is to be done—where safety is a factor—where economy is practiced, there our "Ajax" Transmission Rope should be used.

ROPE TRANSMISSION



The advantages of transmitting power by manila rope are now too well known to require description here; to those interested in this subject we shall be glad to send copies of our pamphlets "A Treatise on Rope Transmission" and "Ajax Transmission Rope." These pamphlets describe the different systems, formulae and methods of splicing rope.

TABLE X.—HORSE-POWER TRANSMITTED BY MANILA ROPES.

(From Channon's Treatise on Rope Transmission.)

Working strain = $200d^2$ pounds. d = diameter of rope in inches.

Velocity of Rope in Feet per Minute	DIAMETER OF ROPE, INCHES					
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
1,000	1.24	2.25	3.57	5.59	8.02	14.20
2,000	2.70	3.84	6.84	10.68	15.39	27.36
2,500	3.30	4.71	8.38	13.10	18.86	33.54
3,000	3.83	5.46	9.80	15.39	21.87	38.88
3,500	4.30	6.23	11.09	17.33	24.94	44.35
4,000	4.74	6.83	12.15	18.98	27.33	48.59
4,500	5.01	7.24	12.89	20.15	29.00	51.57
5,000	5.20	7.47	13.29	20.76	29.89	53.15
5,500	5.29	7.60	13.53	21.14	30.43	54.11
6,000	5.08	7.32	13.10	20.36	29.32	52.12
6,500	4.74	6.83	12.13	19.00	27.34	48.63
7,000	4.12	5.93	10.54	16.47	23.72	42.18
7,500	3.25	4.67	8.32	13.00	18.73	33.23

With Tensions of $200d^2$ pounds, the speed should not exceed 5,500 feet per minute.

For description of Ajax Transmission Rope see other section of this book.

TENSION CARRIAGES

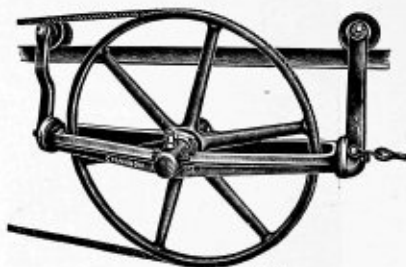
All our carriage wheel bearings are provided with compression grease cups.

"T" iron guides are used, and in most cases weights should be arranged as a counter-balance with Styles I and J.

The list prices shown below do not include price of sheave. This is extra, and price depends on diameter of sheave and size rope. See list of Manila Rope Transmission Sheaves on page



STYLE "M"
Adjustable, for Horizontal Drives



STYLE "G"
Adjustable, Used to Advantage when a Horizontal Drive is Located Along the Wall of a Building—Single Track



STYLE "I"
Adjustable, for Vertical Drives



STYLE "J"
Used for Small Drives

LIST PRICE, NOT INCLUDING PRICE OF SHEAVE

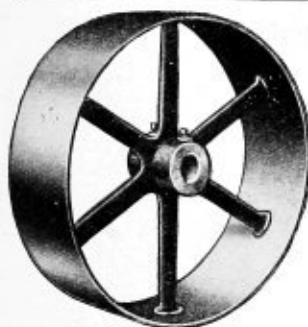
Diameter Sheave, inches	STYLE OF CARRIAGE			
	Style "M"	Style "G"	Style "I"	Style "J"
24	\$ 24.00	\$ 18.00	\$ 14.00	\$13.25
30	35.00	26.00	21.00	14.50
36	48.00	36.00	30.00	17.00
42	54.00	47.00	40.00	18.30
48	73.00	64.00	55.00	19.60
54	96.00	80.00	68.00	
60	125.00	100.00	85.00	
66	158.00	126.00	110.00	
72	195.00	157.00	140.00	
84	235.00	195.00	176.00	
96	280.00	240.00	220.00	

Use Style "I"

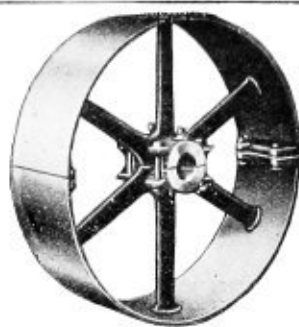
CAST IRON PULLEYS

Machine Moulded and Finished

When ordering be careful to give the following particulars: Diameter, face and bore of pulley; whether crown or straight face, key-seated, set screwed or both and whether for single or double belt. Unless otherwise specified crown-face pulleys are always furnished. Pulleys both key-seated and set-screwed, tight and loose, split and flanged, are subject to extra charge as listed on the following page.



Solid Pulley



Split Pulley

SOLID PULLEYS FOR SINGLE BELT

Diameter, Inches	WIDTH OF FACE, INCHES									
	3	4	5	6	7	8	9	10	11	12
6	\$ 1.95	\$ 2.10	\$ 2.30	\$ 2.55	.....	.....	.....	.....	.....	.....
7	2.10	2.25	2.50	2.75	.....	.....	.....	.....	.....	.....
8	2.25	2.45	2.70	2.95	.....	.....	.....	.....	.....	.....
9	2.40	2.60	2.85	3.15	.....	.....	.....	.....	.....	.....
10	2.55	2.75	3.05	3.40	\$ 3.70	\$ 4.05	.....	.....	.....	.....
11	2.70	2.95	3.25	3.60	3.95	4.35	.....	.....	.....	.....
12	2.85	3.15	3.50	3.85	4.20	4.55	.....	.....	.....	.....
14	3.25	3.55	3.90	4.35	4.70	5.20	.....	.....	.....	.....
16	3.60	3.95	4.40	4.90	5.35	5.85	.....	.....	.....	.....
18	4.00	4.45	4.95	5.50	6.05	6.60	\$ 7.15	.....	.....	.....
20	4.45	4.95	5.55	6.20	6.85	7.50	8.15	\$ 8.85	.....	.....
22	4.90	5.55	6.15	6.90	7.65	8.40	9.15	9.95	.....	.....
24	5.40	6.10	6.85	7.65	8.45	9.30	10.20	11.10	.....	.....
26	6.00	6.90	7.65	8.60	9.45	10.55	11.50	12.60	\$ 13.75	\$ 15.00
28	6.75	7.70	8.50	9.50	10.60	11.70	12.90	13.10	15.45	16.85
30	7.60	8.55	9.45	10.55	11.75	13.00	14.30	15.75	17.15	18.60
36	10.40	11.40	12.65	14.10	15.70	17.35	19.10	20.85	22.70	24.50
40	.....	13.70	15.30	17.10	18.90	20.80	22.75	24.75	26.80	28.80
48	.....	19.00	21.20	23.50	25.85	28.25	30.65	33.15	35.70	38.20
60	.....	.....	.....	34.80	37.50	40.35	43.45	46.85	50.45	54.20
72	.....	.....	.....	47.50	51.75	56.00	60.30	64.70	69.25	74.00

SOLID PULLEYS FOR DOUBLE BELT

Diam. Inches	WIDTH OF FACE, INCHES															
	3	4	5	6	7	8	9	10	11	12	14	16	18	20	24	30
6	\$2.55	\$2.80	\$3.10	\$3.45	\$3.80	\$4.15	\$4.50	\$4.85	\$5.25	\$5.65	.....	.....	.....	.....	.....	.....
7	2.75	3.00	3.35	3.70	4.05	4.45	4.85	5.25	5.70	6.10	.....	.....	.....	.....	.....	.....
8	2.95	3.20	3.55	3.95	4.35	4.75	5.20	5.70	6.15	6.60	\$ 7.75	.....	.....	.....	.....	.....
9	3.15	3.45	3.80	4.25	4.65	5.10	5.60	6.10	6.60	7.10	8.30	.....	.....	.....	.....	.....
10	3.35	3.70	4.10	4.55	5.00	5.50	6.00	6.55	7.10	7.65	8.90	\$10.05	.....	.....	.....	.....
11	3.55	3.95	4.40	4.90	5.40	5.95	6.45	7.05	7.65	8.20	9.50	10.75	.....	.....	.....	.....
12	3.75	4.20	4.70	5.25	5.80	6.35	6.95	7.55	8.15	8.75	10.10	11.50	\$13.00	.....	.....	.....
14	4.20	4.70	5.30	5.95	6.55	7.20	7.90	8.60	9.30	10.00	11.60	13.25	15.00	\$16.80	.....	.....
16	4.70	5.30	6.00	6.70	7.45	8.20	9.00	9.90	10.60	11.45	13.25	15.15	17.15	19.15	.....	.....
18	5.25	5.95	6.75	7.60	8.45	9.30	10.20	11.10	12.05	13.05	15.10	17.20	19.40	21.70	.....	.....
20	5.85	6.65	7.55	8.60	9.60	10.60	11.70	12.80	13.90	15.00	17.40	19.80	22.40	25.00	\$30.60	\$ 40.95
22	6.45	7.40	8.45	9.60	10.80	12.00	13.20	14.50	15.75	17.00	19.70	22.40	25.40	28.30	34.80	45.20
24	7.00	8.15	9.35	10.65	12.00	13.40	14.80	16.20	17.65	19.00	22.00	25.10	28.40	31.70	39.00	50.70
26	7.80	9.15	10.45	11.90	13.40	14.90	16.40	18.00	19.60	21.10	24.55	28.10	31.80	35.55	43.45	55.80
28	8.70	10.10	11.55	13.15	14.80	16.40	18.05	19.80	21.60	23.30	27.10	31.10	35.25	39.45	47.90	60.90
30	9.60	11.10	12.70	14.55	16.20	18.00	19.80	21.60	23.50	25.50	29.70	34.20	38.70	43.25	52.40	66.10
36	12.75	14.75	16.95	19.20	21.45	23.70	26.00	28.30	30.70	33.10	38.55	44.00	49.50	55.90	65.80	82.55
40	.....	17.75	19.95	22.20	24.55	28.10	30.70	33.30	36.05	38.75	44.80	52.65	57.50	63.70	75.90	94.95
48	.....	24.50	27.70	31.00	34.30	37.65	41.05	44.45	48.00	51.50	59.00	66.70	74.50	82.30	98.00	112.30
60	.....	.....	46.00	50.00	54.10	58.35	62.75	67.30	72.00	82.55	92.15	103.50	114.45	136.50	169.90	203.20
72	.....	.....	61.00	66.75	72.55	78.40	84.30	90.30	96.50	109.45	122.75	136.50	150.60	179.50	222.60	265.80

Cast Iron Pulleys are not carried in stock but are made up to order only in our foundry and can be shipped promptly. **Cast Iron Pulleys are not returnable.**

CAST IRON PULLEYS—Continued

SPLIT PULLEYS FOR SINGLE BELT

Diameter, inches	WIDTH OF FACE—INCHES										
	3	4	5	6	7	8	9	10	12	14	16
6.....	\$ 3.25	\$ 3.85	\$ 4.05	\$ 4.30	....	....	....	....	....	....	....
7.....	3.40	4.00	4.25	4.50	....	....	....	....	....	....	....
8.....	3.55	4.20	4.45	4.70	\$ 5.35	\$ 5.60	....	....	....	....	....
9.....	3.70	4.35	4.60	4.90	5.60	5.90	\$ 6.25	....	....	....	....
10.....	3.85	4.50	4.80	5.15	5.85	6.20	6.55	\$ 6.90	....	....	....
11.....	4.20	5.15	5.45	5.80	6.80	7.20	7.50	7.90	....	....	....
12.....	4.35	5.35	5.70	6.05	7.05	7.40	7.80	8.20	....	....	....
14.....	4.75	5.75	6.10	6.55	7.55	8.05	8.45	8.95	....	....	....
16.....	5.10	6.15	6.60	7.10	8.20	8.70	9.15	9.70	\$12.00	....	....
18.....	5.50	6.65	7.15	7.70	8.90	9.45	10.00	10.60	13.10	....	....
20.....	7.10	7.60	8.95	9.60	10.90	11.55	12.20	12.90	16.00	\$18.00	....
22.....	7.55	8.20	9.55	10.30	11.70	12.45	13.20	14.00	17.30	19.65	....
24.....	9.00	9.70	11.25	12.05	13.85	14.70	15.60	16.50	20.40	22.95	....
26.....	9.60	10.50	12.05	13.00	14.85	15.95	16.90	18.00	22.25	24.90	....
28.....	10.35	11.30	12.90	13.90	16.00	17.10	18.30	18.50	24.10	26.80	....
30.....	11.20	12.15	13.85	14.95	17.15	18.40	19.70	21.15	25.85	28.80	....
36.....	14.90	15.90	18.25	19.70	22.45	24.10	25.85	27.60	34.30	37.90	....
40.....	....	20.20	22.80	24.60	28.80	30.70	32.65	34.65	42.30	46.40	....
48.....	....	29.00	31.20	33.50	38.85	41.25	43.65	46.15	56.20	61.30	....
54.....	....	....	36.20	38.90	44.65	47.40	50.20	53.05	64.00	70.20	\$83.70

SPLIT PULLEYS FOR DOUBLE BELT.

Diameter, inches	WIDTH OF FACE—INCHES												
	3	4	5	6	7	8	9	10	12	14	16	18	20
8.....	\$ 4.25	\$ 4.95	\$ 5.30	\$ 5.70	\$ 6.50	\$ 6.90	\$ 7.35	\$ 7.85	\$ 9.70	\$10.85	....	....	....
9.....	4.45	5.20	5.55	6.00	6.80	7.25	7.75	8.25	10.20	11.40	....	....	....
10.....	4.65	5.45	5.85	6.30	7.15	7.65	8.15	8.70	10.75	12.00	....	....	....
11.....	5.05	6.15	6.60	7.10	8.25	8.80	9.30	9.90	12.20	13.50	....	....	....
12.....	5.25	6.40	6.90	7.45	8.65	9.20	9.80	10.40	12.75	14.10	....	....	....
14.....	5.70	6.90	7.50	8.15	9.40	10.05	10.75	11.45	14.00	15.00	....	....	....
16.....	6.20	7.50	8.20	8.90	10.30	11.05	11.85	12.75	15.45	17.25	\$20.40	....	....
18.....	6.75	8.15	8.95	9.80	11.30	12.15	13.05	13.95	17.05	19.10	22.45	\$24.65	....
20.....	8.50	9.30	10.95	12.00	13.65	14.65	15.75	16.85	20.60	23.00	27.10	29.70	\$32.20
22.....	9.10	10.05	11.85	13.00	14.85	16.05	17.25	18.55	22.60	25.30	29.70	32.70	35.60
24.....	10.60	11.75	13.75	15.05	17.40	18.80	20.20	21.60	26.25	29.25	35.10	38.40	41.70
26.....	11.40	12.75	14.85	16.30	18.80	20.30	21.80	23.40	28.35	31.80	38.10	41.80	45.55
28.....	12.30	13.70	15.95	17.55	20.20	21.80	23.45	25.20	30.55	34.35	41.10	45.25	49.45
30.....	13.20	14.70	17.10	18.95	21.60	23.40	25.20	27.00	32.75	36.95	44.20	48.70	53.25
36.....	17.25	19.25	22.55	24.80	28.20	29.85	32.75	35.05	42.90	48.35	57.05	62.55	68.05
40.....	....	25.25	27.80	30.40	35.40	38.00	40.60	43.20	52.25	58.30	68.90	75.50	81.70
48.....	....	34.50	37.70	41.00	47.30	50.65	54.05	57.45	69.50	77.00	91.70	99.50	107.30
60.....	....	....	....	56.00	63.00	67.10	71.35	75.75	90.00	100.55	117.55	128.50	139.45

Add to list price for tight and loose pulleys per pair and finished flanged pulleys each. Pulleys with one flange add half of list; with three flanges add one-half more than given.

Diameter, inches	Tight and Loose Pul- leys, Price per Pair	Double Flanged Pul- leys, Price Each
3 to 8	\$1.60	\$ 4.65
8½ to 10	1.95	5.20
10½ to 12	2.30	5.75
12½ to 14	2.65	6.30
14½ to 16	3.00	7.15
16½ to 18	3.30	8.00
19 to 20	3.70	8.80
21 to 22	4.05	9.90
23 to 24	4.40	11.00
25 to 26	4.75	12.10
27 to 28	5.10	13.75
29 to 30	5.45	15.40
31 to 32	5.80	17.05
33 to 34	6.15	18.70
35 to 36	6.50	20.35
37 to 40	7.20	23.10
41 to 44	7.90	25.80
45 to 48	8.60	29.70

MAXIMUM BORES FOR STANDARD PULLEYS

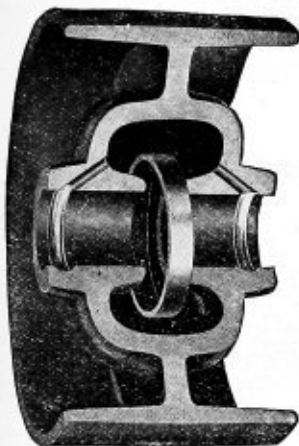
Diameter, inches	Maximum Bore, inches	Additional for Larger Bores
6 to 9	2 ¼	For each ¼ inch larger bore or fraction there- of add 10 per Cent.
10 " 15	2 ½	
16 " 20	3 ¼	
21 " 30	3 ½	For each ¼ inch larger bore or fraction there- of add 5 Per Cent.
31 " 42	4 ½	
43 " 48	4 ¾	
49 " 60	5 ½	

Pulleys with bores larger than the maximum will be furnished in double belt only.

DAVIS RING OILING LOOSE PULLEYS

Always Properly Lubricated

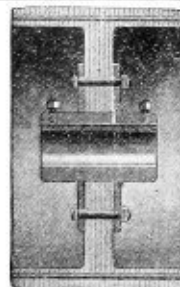
The "Davis" Ring Oiling pulley overcomes trouble and annoyance caused by the difficulty in keeping loose pulleys properly lubricated. It has been put to a thorough and severe test and has proved itself to be reliable and efficient.



Diameter, inches	WIDTH OF FACE—INCHES									
	2	3	4	5	6	7	8	9	10	12
5	\$3.20	\$ 5.50	\$ 5.70	\$ 6.00						
6		6.00	6.40	6.60	\$ 7.00	\$ 7.40	\$ 8.20			
7		6.40	6.60	6.80	7.20	7.60	8.20			
8		6.60	6.80	7.20	7.60	8.00	9.00			
9		6.80	7.50	7.00	8.00	8.40	9.20	\$10.00		\$11.20
10		7.50	7.70	8.00	8.20	8.70	10.00	11.20		12.00
12		8.50	9.30	9.50	9.70	10.40	10.80	13.50		14.40
14		9.50	9.90	10.60	11.10	12.50	12.70	15.50		16.00
16		11.00	12.00	12.50	13.50	13.60	15.50	16.50		17.50
18		12.00	12.30	12.50	13.10	13.70	14.00	17.80		18.20
20		12.50	13.00	12.50	13.40	14.50	15.20	19.00		20.00
22		13.50	13.90	14.20	15.20	16.20	17.50	22.00		22.50
24		14.00	14.50	15.40	15.60	18.00	18.50	22.50		\$25.00

PAPER PULLEYS

Paper pulleys have a very high belt efficiency; they are economical because of reduced slippage, decreased belt tension, and increased power transmission, resulting in a lower total cost. While light in weight, they are very strong and durable and are not injured by steam or atmospheric conditions. Paper is of uniform density and pulleys are perfectly balanced. Made up to 72 inches diameter. Larger sizes than listed and intermediate sizes quoted on application.

Small
Motor Pulley,
Center HubRegular
Crown Face

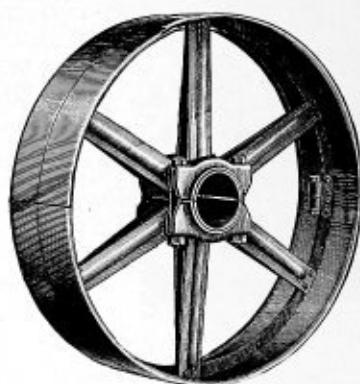
Diameter, inches	WIDTH OF FACE—INCHES										
	2	3	4	5	6	8	10	12	14	16	
2	\$2.00	\$2.05	\$2.10	\$2.20	\$2.35						
2½	2.05	2.10	2.15	2.25	2.40						
3	2.10	2.15	2.20	2.30	2.45						
3½	2.15	2.20	2.25	2.35	2.50	\$2.95					
4	2.20	2.25	2.30	2.40	2.55	3.00					
4½	2.25	2.30	2.35	2.45	2.60	3.05					
5	2.30		2.40	2.50	2.65	3.10	\$3.75				
6		2.05	3.15	3.25	3.45	4.00	4.80				
8		3.40	3.45	3.55	3.75	4.30	5.10	\$6.20			
10		3.75	3.80	3.95	4.15	4.70	5.50	6.55	\$9.45	\$11.35	
12		4.25	4.45	4.70	5.00	5.80	6.90	8.20	11.70	13.85	
14		4.75	5.00	5.30	5.70	6.60	7.80	9.25	13.15	15.70	
16		5.30	5.70	6.10	6.60	7.80	9.25	10.95	15.00	18.05	\$31.60
20			7.15	7.75	8.45	10.00	11.85	13.90	16.20	22.50	37.80
24			8.80	9.60	10.50	12.45	14.60	17.05	19.75	27.70	44.30
28				11.80	12.95	15.40	18.05	21.00	24.20	32.60	52.65
32				14.05	15.40	18.20	21.25	24.55	28.10	37.80	59.65
36				16.50	18.00	21.20	24.60	28.20	32.25	44.30	66.85
40				19.10	20.90	24.40	28.20	32.25	34.60	47.00	74.25
48					28.55	33.00	37.70	42.65	47.80	53.25	93.00

WROUGHT STEEL SPLIT PULLEYS

Metal Bushings to Fit Any Shaft



The "Oneida"



The "American"

AMERICAN AND ONEIDA STEEL PULLEYS TAKE SAME LIST

Diameter, inches	WIDTH OF FACE, INCHES											
	3	4	5	6	8	10	12	14	16	18	22	30
6	\$3.30	\$3.45	\$3.75	\$4.05	.....	.....	.....	.....	.....	.....	.....	.....
7	3.38	3.60	3.90	4.20	.....	.....	.....	.....	.....	.....	.....	.....
8	3.45	3.75	4.05	4.35	\$4.95	\$5.60	.....	.....	.....	.....	.....	.....
9	3.60	3.90	4.20	4.50	5.10	5.75	.....	.....	.....	.....	.....	.....
10	3.75	4.05	4.35	4.65	5.25	5.90	\$6.45	.....	.....	.....	.....	.....
11	3.90	4.20	4.50	4.80	5.40	6.00	6.90	.....	.....	.....	.....	.....
12	4.20	4.63	4.80	5.32	5.78	6.45	7.65	\$9.00	\$ 10.25	\$ 11.75	.....	.....
13	4.35	4.80	5.20	5.62	6.43	7.20	8.40	9.50	10.75	12.25	.....	.....
14	4.50	5.20	5.65	6.15	7.05	8.03	9.00	10.00	11.25	13.00	.....	.....
16	4.95	5.75	6.10	6.90	8.25	9.45	10.50	11.50	12.65	14.50	.....	.....
18	5.55	6.38	7.00	7.65	9.30	10.65	12.00	13.25	14.50	16.75	.....	.....
20	6.00	7.50	8.10	9.00	10.72	12.00	14.25	15.50	16.90	19.25	.....	.....
22	6.50	8.55	9.50	10.28	12.00	14.10	16.80	19.20	22.20	25.50	.....	.....
24	7.50	.....	.....	.....	13.20	15.68	19.05	22.80	27.30	32.75	.....	.....
26	.....	9.55	10.50	11.95	14.40	17.10	21.30	26.25	31.20	37.50	.....	.....
28	.....	10.80	11.70	12.90	15.45	18.15	22.90	28.50	34.50	41.50	.....	.....
30	.....	12.00	12.90	14.10	17.25	19.90	24.75	31.50	38.10	45.75	\$ 58.00	\$ 95.00
32	.....	.....	.....	.....	24.00	28.65	33.75	39.75	48.60	55.50	85.00	124.00
36	.....	15.90	17.85	19.50	28.50	33.75	40.15	46.50	55.15	62.25	105.00	148.00
40	.....	21.90	22.75	24.00	28.50	33.75	40.15	46.50	55.15	62.25	105.00	148.00
44	.....	.....	.....	30.20	37.10	43.13	50.00	57.80	66.40	75.50	120.00	162.00
48	.....	.....	.....	39.91	49.00	57.05	66.15	76.29	87.80	99.90	138.00	183.40
52	.....	.....	.....	49.10	60.20	68.25	81.85	90.80	107.55	116.95	162.30	207.15
56	.....	.....	.....	57.65	70.55	79.55	91.30	101.60	119.55	130.35	181.10	232.10
60	.....	.....	.....	61.60	75.80	83.30	99.00	110.60	129.30	141.35	196.60	252.90
64	.....	.....	.....	.....	88.10	98.90	116.20	129.10	151.10	163.75	227.75	289.50
68	.....	.....	.....	.....	94.85	106.80	125.60	138.85	162.30	176.10	244.45	311.60
72	.....	.....	.....	.....	101.80	114.70	134.75	149.00	173.50	188.65	261.50	334.40
76	.....	.....	.....	.....	105.30	116.00	139.70	154.50	179.55	195.25	270.40	345.90
80	.....	.....	.....	.....	108.95	123.95	144.65	160.00	185.60	201.80	279.25	357.40
84	.....	.....	.....	.....	116.55	131.85	154.35	171.00	197.95	215.40	297.45	380.85
88	.....	.....	.....	.....	124.55	140.65	162.90	182.15	210.55	229.35	316.00	404.85
92	.....	.....	.....	.....	148.60	165.25	182.90	200.00	236.00	256.80	348.00	441.40
96	.....	.....	.....	.....	156.95	174.90	193.60	212.60	249.50	269.50	367.95	466.50
100	.....	.....	.....	.....	.....	186.00	204.60	225.00	263.00	284.90	388.60	493.15
104	.....	.....	.....	.....	.....	190.00	210.10	231.00	269.70	292.60	403.90	506.45
.....	.....	.....	.....	.....	.....	201.80	223.30	245.70	285.60	308.00	421.50	533.85
.....	.....	.....	.....	.....	.....	212.90	235.70	259.30	300.50	324.60	440.70	559.40

Sizes not listed, up to 120-inch diameter by 40-inch face, also intermediate even diameters and faces, can be furnished at corresponding list prices.

The "American" pulley can be furnished from stock in all sizes up to 60-inch diameter by 16-inch face; the "Oneida" in all sizes up to 72-inch diameter by 16-inch face.

Other standard sizes of either style can be furnished promptly from factory.

WOOD SPLIT PULLEYS



Fig. 1

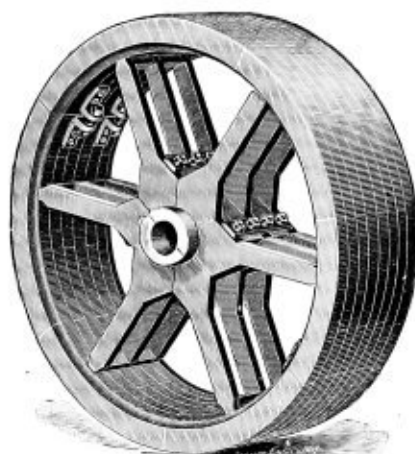


Fig. 2

WIDTH OF FACE

Diam., inches	3	4	5	6	8	10	12	14	16	18	20	22	24
4	\$2.90	\$2.90	\$3.10	\$3.20	\$3.70	\$4.10	\$4.50						
5	2.85	2.95	3.20	3.40	3.85	4.30	4.75						
6	2.90	3.00	3.25	3.50	4.00	4.50	5.00						
7	2.95	3.05	3.30	3.60	4.15	4.70	5.25	\$5.80					
8	3.00	3.10	3.40	3.70	4.30	4.90	5.50	6.10					
9	3.10	3.25	3.60	3.90	4.55	5.20	5.85	6.50					
10	3.25	3.40	3.75	4.10	4.80	5.50	6.20	6.90	\$7.60				
11	3.50	3.70	4.10	4.50	5.20	6.00	6.90	7.70	8.50				
12	3.75	4.00	4.45	4.90	5.60	6.50	7.60	8.50	9.40	\$10.30			
13		4.30	4.80	5.30	6.00	7.00	8.30	9.30	10.30	11.30			
14		4.60	5.15	5.70	6.50	7.60	8.90	10.10	11.20	12.30	\$13.40		
15		4.90	5.50	6.10	7.00	8.20	9.70	10.90	12.20	13.30	14.50		
16		5.20	5.85	6.50	7.50	8.80	10.40	11.70	13.00	14.30	15.60	\$16.90	
17		5.50	6.20	6.90	8.00	9.40	11.10	12.50	13.90	15.30	16.70	18.10	
18		5.80	6.55	7.30	8.50	10.00	11.80	13.30	14.80	16.30	17.80	19.30	\$20.80
19		6.10	6.90	7.70	9.00	10.60	12.50	14.10	15.70	17.30	18.90	20.50	22.10
20		6.40	7.25	8.10	9.50	11.20	13.20	14.90	16.60	18.30	20.00	21.70	23.40
22		7.00	7.95	8.90	10.50	12.40	14.60	16.50	18.40	20.30	22.20	24.10	26.00
24		7.70	8.80	9.90	12.10	14.30	16.50	18.70	20.90	23.10	25.30	27.50	29.70
26		8.40	9.65	10.90	13.40	15.90	18.40	20.90	23.40	25.90	28.40	30.90	33.40
28		9.10	10.50	11.90	14.70	17.50	20.30	23.10	25.90	28.70	31.50	34.30	37.10
30		9.80	11.35	12.90	16.00	19.10	22.20	25.30	28.40	31.50	34.60	37.70	40.80
32		10.50	12.20	13.90	17.30	20.70	24.10	27.50	30.90	34.30	37.70	41.10	44.50
34		11.20	13.15	15.00	18.70	22.40	26.10	29.80	33.50	37.20	40.90	44.60	48.30
36		12.10	14.10	16.10	20.10	24.10	28.10	32.10	36.10	40.10	44.10	48.10	52.10
38				17.20	21.50	25.80	30.10	34.40	38.70	43.00	47.30	51.60	55.90
40				18.30	22.90	27.50	32.10	36.70	41.20	45.90	50.50	55.10	59.70
42				19.60	24.60	29.60	34.60	39.60	44.60	49.60	54.60	59.60	64.60
44				20.90	26.30	31.70	37.10	42.50	47.90	53.30	58.70	64.10	69.50
46				22.30	28.10	33.90	39.70	45.50	51.30	57.10	62.90	68.70	74.50
48				23.80	30.00	36.20	42.40	48.60	54.80	61.00	67.20	73.40	79.60
50				25.40	32.00	38.60	45.20	51.80	58.40	65.00	71.60	78.20	84.80
52				27.10	34.10	41.10	48.10	55.10	62.10	69.10	76.10	83.10	90.10
54				28.90	36.30	43.70	51.00	58.50	66.00	73.50	81.00	88.50	96.00
56				30.80	38.60	46.40	54.20	62.00	69.80	77.60	85.40	93.20	101.00
58				32.80	41.00	49.20	57.40	65.60	73.80	82.00	90.20	98.40	106.60
60				34.90	43.50	52.10	60.70	69.30	77.90	86.50	95.10	103.70	112.30
62				37.10	46.10	55.10	64.10	73.10	82.10	91.10	100.10	109.10	118.10
64				39.40	48.80	58.20	67.60	77.00	86.40	95.80	105.20	114.60	124.00
66				41.90	51.80	61.70	71.60	81.50	91.40	101.30	111.20	121.10	131.00
68				44.50	54.90	65.30	75.70	86.10	96.50	106.90	117.30	127.70	138.10
70				47.20	58.10	69.00	79.90	90.80	101.70	112.60	123.50	134.40	145.30
72				50.00	61.40	72.80	84.20	95.60	107.00	118.40	129.80	141.20	152.60
74					71.90	84.90	97.70	110.60	123.50	136.40	149.30	162.20	175.10
80					83.30	97.70	112.10	126.50	140.90	155.30	169.70	184.10	198.50
86					95.60	111.50	127.40	143.30	159.20	175.10	191.00	206.90	222.80
92					109.00	126.50	144.00	161.50	179.00	196.50	214.00	231.50	249.00
102					123.70	143.00	162.30	181.60	200.90	220.20	239.50	258.80	278.10
108					139.30	160.40	181.50	202.60	223.70	244.80	265.90	287.00	308.10
114					155.80	178.70	201.60	224.50	247.40	270.30	293.20	316.10	339.00
120					173.20	197.90	222.60	247.30	272.00	296.70	321.40	346.10	370.80

In ordering always state diameter, width of face, whether crown or straight face is desired and size of shaft. Unless otherwise specified crown face pulleys are always furnished.

Fig. 1: 3 inch to 6 inch Pulley solid block construction; 9 inch to 34 inch single arm, and over 36 inch double arm construction.

Fig. 2: 3 inch to 12 inch solid block construction, 13 inch to 24 inch 4 spoke, 24 inch to 58 inch 6 spoke, and larger than 58 inch 8 spoke construction.

3 inch pulleys take same list as 4 inch.

SPECIAL PULLEYS



Step Cone Pulley



Taper Cone Pulley

STEP CONE PULLEYS

Step Cone Pulleys. Treat each step as a separate pulley, combining the list and add 50 per cent.

TAPER CONE PULLEYS

Taper Cone. Use list for largest diameter and full width of face and add 25 per cent to make total list.

FLANGE PULLEYS

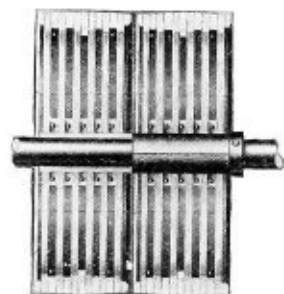
Flanged Pulleys. Add to regular list 40c for each inch in diameter of pulley for single flange, 60c for double flange, and 80c for triple flange, crating included.

TIGHT AND LOOSE PULLEYS

To ascertain the list price on loose pulleys take the list on a regular pulley and add for the iron bushing according to the table given below.

For the tight pulley use the standard pulley with wood bushing.

Price List Split Babbitted Iron Bushing



Shaft	Face						
	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.	12 in.
1 1/2	\$3.90	\$5.20	\$6.50	\$7.80	\$9.10	\$13.00	\$15.60
1 7/8	4.05	5.40	6.75	8.10	10.80	13.50	16.20
1 1/2	4.20	5.60	7.00	8.40	11.20	14.00	16.80
1 3/4	4.35	5.80	7.25	8.70	11.60	14.50	17.40
2 1/8	4.50	6.00	7.50	9.00	12.00	15.00	18.00
2 1/4	4.65	6.20	7.75	9.30	12.40	15.50	18.60
2 3/8	4.80	6.40	8.00	9.60	12.80	16.00	19.20
2 1/2	4.95	6.60	8.25	9.90	13.20	16.50	19.80

Maximum Bores Which Can Be Furnished from Stock

Diameter, inches.....	3	4	5	6	7	8 and Larger
Bore, inches.....	1 1/2	2	2 1/2	3 1/2	3 1/2	3 1/2

Prices for Extra Large Bores

For boring pulleys larger than maximum stock bores but smaller than bores shown in the following table, add 10 per cent to regular list.

Diameter, inches	ADD TO REGULAR LIST					
	15%	20%	25%	35%	50%	60%
Under 12.....	3 1/8 to 4	4 1/8 to 5	5 1/8 to 6	7 1/8 to 10	12 1/8 to 15	15 1/8 to 18
12 to 48.....	4 1/8 to 4 1/2	4 1/8 to 6	6 1/8 to 7 1/2	7 1/8 to 10	12 1/8 to 15	15 1/8 to 18
49 to 72.....	5 1/8 to 6	6 1/8 to 7 1/2	7 1/8 to 9 1/2	9 1/8 to 12	12 1/8 to 15	15 1/8 to 18

Pulleys with special bores are made to order only.

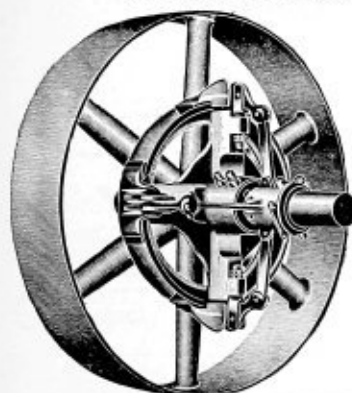
BUSHINGS

We furnish one bushing with every pulley where the size of shaft requires one.

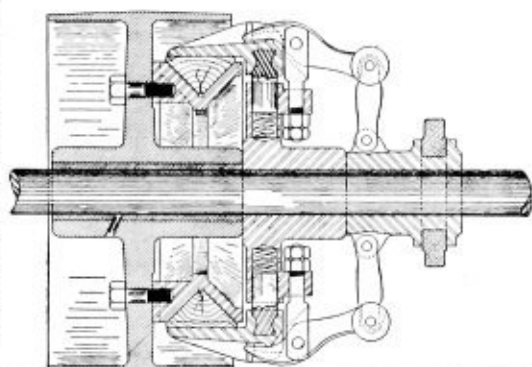
Extra or Separate Bushings

10 inches or less of complete bushing.....	\$0.50
More than 10 inches of complete bushing.....	per inch, .05

JONES BALANCED FRICTION CLUTCH PULLEYS



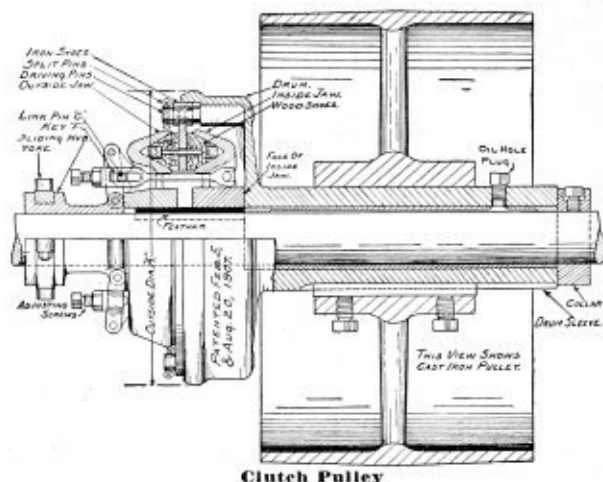
The clutch is simple and durable. All parts are accessible and easily adjusted—no enclosed Mechanism. Small parts are cast steel and the "V" shaped Friction Shoes are of hard Maple. Can be operated at high speeds, as the Governor ball levers counterbalance the centrifugal force of the friction shoes.



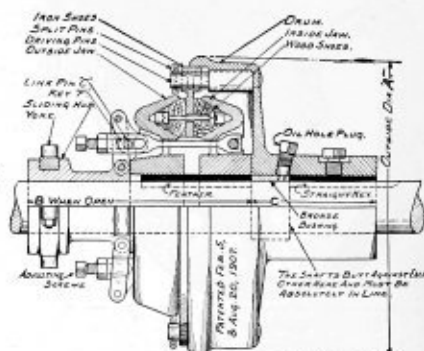
Diam. inches	Face, inches	H. P. 100 Rev.	Size of Clutch	Price	Diam. inches	Face, inches	H. P. 100 Rev.	Size of Clutch	Price	Diam. inches	Face, inches	H. P. 100 Rev.	Size of Clutch	Price	Diam. inches	Face, inches	H. P. 100 Rev.	Size of Clutch	Price	
18	4	4.0	8	\$14.90	28	12	18.5	14	\$75.40	38	7	14.7	12	\$81.95	54	16	48.0	24	\$218.15	
5	5.0	8	36.25		14	21.6	16	83.10		8	16.8	14	86.05	18	54.0	24	240.50			
6	6.0	10	37.75		16	21.7	16	91.65		10	21.1	16	94.86	20	60.0	24	265.15			
7	7.0	10	39.20		18	28.0	18	101.05		12	25.3	18	104.06	22	66.0	30	292.30			
8	8.0	10	40.80		6	10.0	12	59.95		14	29.5	18	115.30	24	72.0	30	322.25			
9	9.0	10	45.65		7	11.5	12	62.90		16	33.7	18	127.10	26	78.0	30	355.25			
10	10.0	12	52.75		8	13.3	12	66.05		18	38.0	20	140.10	28	84.0	30	391.63			
20	4	4.3	8	37.75	9	15.0	14	69.40		20	42.2	20	154.45	60	6	20.0	16	183.00		
5	5.5	8	39.36		10	16.5	14	72.85		40	6	14.1	12	87.85	8	26.6	18	199.20		
6	6.5	10	40.86		12	20.0	16	81.30		8	18.7	14	96.85	10	33.3	18	215.15			
7	7.6	10	42.45		14	23.3	16	85.75		10	22.4	16	106.75	12	40.0	20	232.35			
8	8.8	10	44.15		16	26.5	18	94.55		12	27.9	18	117.70	14	46.6	24	250.90			
9	10.0	12	45.95		18	30.0	18	104.15		14	31.6	18	129.70	16	53.3	24	276.00			
10	11.1	12	49.75		6	10.5	12	63.75		16	57.4	20	143.00	18	60.0	24	292.68			
22	4	4.8	8	41.05	7	12.4	12	67.00		18	42.1	20	157.65	20	66.6	30	316.95			
5	6.1	10	42.75		8	14.2	12	70.30		20	44.8	20	173.80	22	73.3	30	341.35			
6	7.3	10	44.50		9	16.0	14	73.80		22	51.5	24	191.70	24	80.0	30	369.65			
7	8.5	10	46.36		10	17.7	14	77.50		24	59.9	24	211.35	26	86.6	30	398.15			
8	9.7	10	47.20		12	21.3	16	85.45		42	6	14.0	12	91.30	28	93.3	36	434.00		
9	11.0	12	50.35		14	24.8	16	94.15		8	18.6	14	100.55	30	105.0	36	473.00			
10	12.2	12	52.40		16	28.4	18	103.80		10	23.3	16	110.85	66	8	29.3	18	224.05		
12	14.0	12	51.68		18	32.0	18	114.45		12	28.0	18	122.20	10	36.6	20	241.95			
24	4	5.3	8	44.50	20	35.3	20	120.55		14	32.6	18	134.70	12	44.0	20	261.30			
5	6.5	10	46.35		6	11.3	12	67.85		16	37.3	20	148.50	14	51.3	24	282.20			
6	8.0	10	47.25		7	13.2	12	71.25		18	42.0	20	163.75	16	58.6	24	304.80			
7	9.3	10	50.35		8	15.1	14	74.75		20	46.2	24	180.50	18	66.0	30	329.15			
8	10.5	12	52.40		9	17.0	14	78.80		22	51.3	24	199.00	20	73.3	30	355.50			
9	12.0	12	54.60		10	18.8	14	82.45		24	56.0	24	219.35	22	80.6	30	383.95			
10	13.1	12	56.90		12	22.6	16	90.90		48	6	16.0	14	115.50	24	88.0	30	414.65		
12	16.0	14	61.65		14	26.4	18	100.20		8	21.3	16	127.35	26	96.6	30	447.80			
14	18.5	14	66.95		16	30.2	18	110.45		10	26.6	18	140.35	28	104.3	36	483.60			
26	4	5.6	8	48.30	18	34.0	18	121.80		12	32.0	18	154.78	30	112.6	36	532.30			
5	7.2	10	50.70		20	37.7	20	132.80		14	37.3	20	170.60	72	8	32.0	18	252.05		
6	8.5	10	53.25		6	12.0	12	72.20		16	42.6	20	188.10	10	40.0	20	272.20			
7	0.1	12	55.90		7	14.0	12	75.80		18	48.0	24	207.35	12	48.0	24	294.00			
8	1.5	12	58.70		8	16.0	14	79.60		20	53.3	24	228.60	14	56.0	24	317.50			
10	14.4	12	64.70		9	18.0	14	83.60		22	58.6	24	252.00	16	64.0	24	342.90			
12	17.3	14	71.30		10	20.0	16	87.75		24	64.0	24	277.85	18	72.0	30	370.30			
14	20.2	16	78.60		12	24.0	16	96.75		26	69.3	30	305.30	20	80.0	30	396.25			
28	6	9.3	10	56.36	14	28.0	18	106.65		54	6	18.0	14	133.95	22	88.0	30	423.95		
7	10.3	12	59.15		16	32.0	18	117.55		8	24.0	16	147.65	24	96.0	30	453.65			
8	12.4	12	62.05		18	36.0	20	129.60		10	30.0	18	162.80	...	...	...	...
9	14.0	12	65.15		20	40.0	20	142.90		12	36.0	20	179.50	...	...	...	...
10	15.5	14	68.40		28	6	12.6	12	78.05	14	42.0	20	197.88	...	...	...	...

Be sure to state Horse Power Required, speed and space available on shaft. Other sizes quoted upon request.

THE MASTER FRICTION CLUTCH (Patented)



Clutch Pulley



Clutch Coupling

See Dimensions in Table Below.

LIST PRICES AND DIMENSIONS OF MASTER FRICTION CLUTCH COUPLINGS

Number of Clutch	List Price Each	H. P. at 100 R. P. M.	Largest Bore inches	Equal to Shaft, inches	Outside Diameter A, inches	SPACE ON SHAFT FOR CLUTCH COUPLING			
						B inches	C inches	Length Bronze Bushing, ins.	Total Space, ins.
4	\$ 30.00	3	1 $\frac{1}{16}$	1 $\frac{1}{16}$	8 $\frac{1}{16}$	9 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{4}$	13
5	42.00	5	1 $\frac{1}{8}$	1 $\frac{1}{8}$	9 $\frac{1}{8}$	10	4	1 $\frac{1}{4}$	14
6	49.00	7	2 $\frac{1}{16}$	2 $\frac{1}{16}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$	14 $\frac{3}{4}$
7	60.00	11	2 $\frac{1}{8}$	2 $\frac{1}{8}$	11 $\frac{1}{8}$	11 $\frac{3}{8}$	4 $\frac{3}{4}$	1 $\frac{1}{2}$	16 $\frac{1}{8}$
8	71.00	15	3 $\frac{1}{16}$	3 $\frac{1}{16}$	13 $\frac{1}{4}$	12 $\frac{3}{4}$	5	1 $\frac{3}{4}$	17 $\frac{3}{8}$
9	88.00	22	3 $\frac{1}{8}$	2 $\frac{3}{8}$	14 $\frac{3}{4}$	12 $\frac{3}{4}$	5 $\frac{1}{2}$	1 $\frac{3}{4}$	18 $\frac{1}{4}$
10	104.00	28	4 $\frac{1}{16}$	2 $\frac{1}{4}$	16 $\frac{3}{16}$	13 $\frac{3}{4}$	5 $\frac{3}{4}$	2	19
11	125.00	37	5 $\frac{1}{4}$	2 $\frac{1}{2}$	18 $\frac{1}{8}$	14 $\frac{3}{8}$	5 $\frac{3}{4}$	2	20 $\frac{1}{8}$
13	145.00	45	6	2 $\frac{1}{2}$	20	14 $\frac{1}{2}$	6 $\frac{3}{4}$	2 $\frac{1}{4}$	21 $\frac{1}{4}$
16	206.00	65	7 $\frac{1}{2}$	3 $\frac{1}{8}$	23 $\frac{3}{8}$	15 $\frac{1}{4}$	7 $\frac{1}{4}$	2 $\frac{1}{2}$	23
20	281.00	100	7 $\frac{1}{2}$	3 $\frac{1}{8}$	28 $\frac{1}{4}$	17	8 $\frac{1}{4}$	2 $\frac{3}{4}$	25 $\frac{1}{4}$
24	359.00	150	10	4 $\frac{1}{16}$	32 $\frac{3}{4}$	19 $\frac{1}{2}$	9	3	28 $\frac{1}{2}$

For Split Clutches add 20 per cent to list.

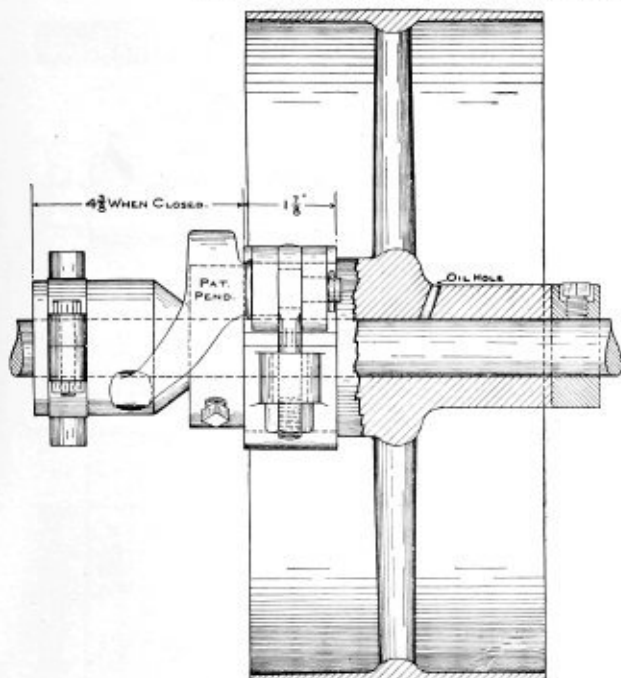
LIST PRICES PER INCH OF EXTENDED CLUTCH SLEEVES FOR PULLEYS, ETC.

To ascertain price of Clutch with Extended Sleeve, add net price of Clutch Coupling to net price of Sleeve. This price does not include pulley.

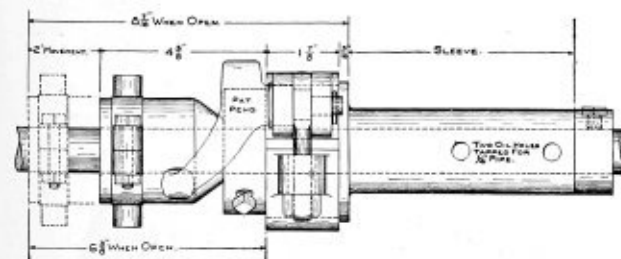
No. of Clutch	List Prices Per Inch of Length of Sleeve.	DIAMETERS OF SHAFTS																							
		1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{2}$	7 $\frac{1}{4}$	8	8 $\frac{1}{2}$	9	10		
4	.40	.45	.55	.60	.70	.80	.85	.90	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	
5	.40	.45	.55	.60	.70	.80	.85	.90	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	
6		.45	.55	.65	.75	.85	.90	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	
7		.50	.60	.70	.80	.90	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	
8			.65	.75	.85	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	
9				.75	.85	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	
10					.85	.95	1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	
11						1.00	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	
12							1.10	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
13								1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
14									1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
15										1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
16											1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
17												1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
18													1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
19														1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
20															1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
21																1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
22																	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	
23																		1.70	1.75	1.80	1.85	1.90	1.95	2.00	
24																			1.75	1.80	1.85	1.90	1.95	2.00	

For Split Sleeves add 20 per cent to list.

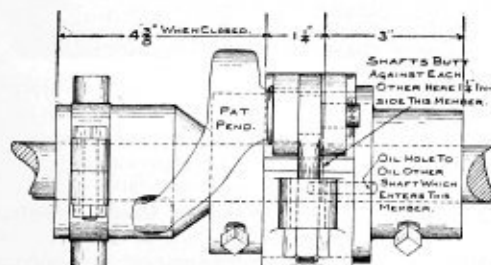
THE MASTER CONTRACTING BAND CLUTCH



CLUTCH PULLEY



CLUTCH WITH EXTENDED SLEEVE



CLUTCH COUPLING

LIST PRICES OF CLUTCH PULLEYS
WITH COLLAR AND LEVER YOKE.

DIA	FACE PRICE	DIA	FACE PRICE	DIA	FACE PRICE
6	3 \$13.60	9	3 \$13.90	13	6 \$15.70
4	13.70	4	14.10	7	16.00
5	13.85	5	14.30	14	3 15.00
6	14.05	6	14.55	4	15.25
7	14.25	7	14.80	5	15.55
8	14.45	8	15.05	6	15.90
9	14.65	9	15.30	15	3 15.15
10	14.90	10	15.60	4	15.40
11	15.15	11	15.85	5	15.75
12	15.40	12	16.10	6	16.10
7	3 13.70	5	14.45	16	3 15.30
4	13.80	6	14.70	4	15.60
5	14.00	7	15.00	5	15.95
6	14.20	8	15.25	17	3 15.85
7	14.40	9	15.55	4	16.20
8	14.60	11	14.60	5	16.60
9	14.85	4	14.80	18	3 16.00
10	15.10	5	15.00	4	16.40
11	15.35	6	15.30	5	16.80
12	15.60	7	15.60	19	3 16.20
8	3 13.80	8	15.90	4	16.60
4	14.00	12	3 14.70	20	3 16.40
5	14.20	4	14.95	4	16.80
6	14.40	5	15.20	21	3 16.60
7	14.60	6	15.50	4	17.00
8	14.80	7	15.80	22	3 16.80
9	15.05	13	3 14.85	4	17.25
10	15.30	4	15.10	23	3 17.10
11	15.60	5	15.40	24	3 17.40

FOR BABBITTED CLUTCH PULLEYS ADD 10%
FOR SPLIT CLUTCH PULLEYS ADD 50%

LIST PRICES AND DIMENSIONS OF CLUTCHES
WITH EXTENDED SLEEVES COMPLETE
WITH COLLAR AND LEVER YOKE.

SIZE	DIAM. SLEEVE	DIAM. BORE	STAND. LENGTH	PRICE WITH SLEEVE	PRICE WITH BABB-ITTED SLEEVE
1 1/2	1 1/2	1 1/2	4 1/2	\$11.00	\$12.10
1 3/4	1 3/4	1 3/4	5	11.00	12.10
2	2	2	5	11.50	12.65
2 1/4	2 1/4	2 1/4	5	11.50	12.65
2 1/2	2 1/2	2 1/2	5	11.50	12.65
2 3/4	2 3/4	2 3/4	6	12.00	13.20
3	3	3	6	12.00	13.20

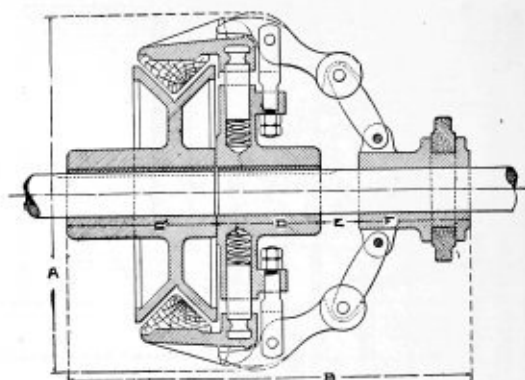
FOR SPLIT CLUTCHES WITH
EXTENDED SLEEVES ADD
50 PER CENT TO PRICE.

LIST PRICE OF CLUTCH COUPLING
COMPLETE WITH LEVER YOKE.

3 H.P. AT 100 R.P.M. PRICE \$11.00

FOR SPLIT CLUTCH COUPLING
ADD 50 PER CENT TO PRICE.

"JONES" FRICTION CLUTCH COUPLINGS



For use as Cut-off Couplings or applied to Pulleys, rope sheaves, gears or sprocket wheels. Always state horse power and speed.

Diameter of Clutch, inches	No. of Arms	Horse Power at 100 Rev.	Largest Bore for Standard Clutch	Total Space on Shaft	Price
8	2	3	2	13½	\$ 50.00
12	3	6	3	16½	60.00
16	4	10	3½	18½	73.00
20	4	15	4	19½	95.00
20	6	20	4	19½	120.00
24	4	25	4½	21	135.00
24	6	30	4½	21	170.00
30	6	45	5	23½	210.00
36	6	65	6	24½	285.00
42	6	100	7	27	320.00
48	6	140	8	30	495.00

DIMENSIONS

Size of Clutch	A	B	C	D	E	F
8	12	13½	5	3½	1¼	3¼
12	18½	16½	5½	4½	1½	5
16	24	18½	6	4½	2	6
20	26½	19½	6½	4¾	2¼	6
24	31	21	6½	5¼	2¼	6¼
30	38	22 5/16	7	6	3 1/8	6¾
36	45	24½	7	6½	4½	6¾
42	52	26	7½	8½	4½	7

For extension sleeve add 10 per cent., for split clutches add 20 per cent. to above lists. Larger clutches and clutches with larger bore than specified quoted on request.

UNIFORM

SMOOTH

COOL



On all classes of transmission machinery, **ONOKO** is the best and most economical bearing metal that can be used. It is equally well adapted for high or low speeds, and its low coefficient of friction effects a great saving in oil, besides permitting the use of a much cheaper grade of lubricant. The exact formula which is rigidly followed in every detail of manufacture, together with the careful, scientific selection of each ingredient, results in an absolutely uniform and definite alloy.

For general use on machinery bearings, especially transmission machinery, **Onoko Babbitt Metal** cannot be excelled.

UNIFORM

SMOOTH

COOL

COLD ROLLED STEEL SHAFTING



Standard Gauge and Straightened

Diameter, inches	Weight, per foot, lbs.	Price, per lb.	Diameter, inches	Weight, per foot, lbs.	Price, per lb.
4	42.75	\$0.06	11 1/2	5.60	\$0.05
3 1/4	41.25	.05 1/2	11 1/8	5.52	.05 1/2
3 1/2	39.95	.05 1/2	11 1/4	5.26	.05 1/2
3 3/4	37.57	.05 1/2	1 1/2	5.05	.05 1/2
3 1/2	36.40	.05 1/2	1 1/8	4.61	.05 1/2
3 3/8	35.20	.05 1/2	1 1/4	4.17	.05 1/2
3 1/2	32.73	.05 1/2	1 3/8	3.86	.05 1/2
3 3/8	31.58	.05 1/2	1 3/4	3.77	.05 1/2
3 3/8	30.43	.05 1/2	1 3/8	3.38	.05 1/2
3 1/2	28.22	.05 1/2	1 3/2	3.20	.05 1/2
3 1/2	27.16	.05 1/2	1 3/4	3.11	.05 1/2
3 1/2	26.09	.05 1/2	1 3/8	3.02	.05 1/2
3	24.05	.05	1	2.68	.05 1/2
2 1/2	23.06	.05	1 1/2	2.52	.05 1/2
2 1/2	22.09	.05	1 1/8	2.35	.05 1/2
2 1/2	21.15	.05	2 1/2	2.20	.05 1/2
2 1/2	20.21	.05	2 1/8	2.05	.05 1/2
2 1/2	19.31	.05	2 1/2	1.94	.05 1/2
2 1/2	18.41	.05	2 1/8	1.90	.05 1/2
2 1/2	17.55	.05	2 1/8	1.77	.05 1/2
2 1/2	16.70	.05	2 1/8	1.50	.05 1/2
2 1/2	15.89	.05	2 1/8	1.38	.06
2 1/2	15.07	.05	2 1/8	1.26	.06
2 1/2	14.35	.05	2 1/8	1.17	.06
2 1/2	13.52	.05	2 1/8	1.05	.06
2 1/2	12.80	.05	2 1/8	1.00	.06
2 1/2	12.07	.05	2 1/8	.845	.06
2 1/2	11.35	.05	2 1/8	.667	.07
2 1/2	10.69	.05	2 1/8	.586	.07
2 1/2	10.03	.05	2 1/8	.511	.07
1 1/2	9.39	.05	2 1/8	.450	.07
1 1/2	8.78	.05	2 1/8	.375	.07
1 1/2	8.18	.05	2 1/8	.320	.08 1/2
1 1/2	7.61	.05	2 1/8	.260	.08 1/2
1 1/2	7.06	.05	2 1/8	.167	.10
1 1/2	6.52	.05	2 1/8	.130	.10
1 1/2	6.01	.05	2 1/8	.095	.10

Shafting over 4 inches in diameter quoted upon application.
 Sizes shown in black face type are the popular sizes.

The above prices are for shafts from 1 foot to 24 feet long, inclusive.

EXTRAS FOR CUTTING REGULAR SHAFTING

Lengths, inches	Rounds	Squares	Flats	Hectagons
3 to 5 1/2	\$1.00	\$1.00	\$2.00	\$1.00
6 to 11 1/2	.50	.50	1.00	.50
12 to 23 1/2	.25	.50	.50	.25
24 to 59 1/2	.10	.25	.25	.10

For lengths shorter than 3 inches special prices will be quoted.

BURR PORTABLE KEY SEATER

No. 1

Will mill key seats in the middle or on the ends of shafting, from 1 1/4 to 5 inches in diameter, without removing it from its hangers or boxes. It will mill a key seat 12 inches long without resetting.

A set of five milling cutters is furnished with each machine, by using one or more of which on the spindle, key seats of any of the following sizes may be cut with one operation: 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 7/8, 15/16, 1, 1 1/8 and 1 1/4 inches. No. 1 Price each.....\$50.00

Weight, net, 76 pounds.

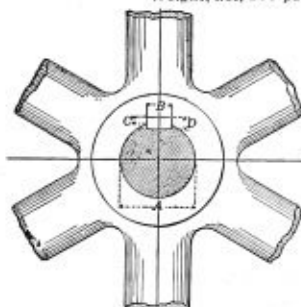
No. 2

Will mill key seats in the middle or on the ends of shafting, from 1 1/8 inches to 8 inches in diameter, without removing it from its hangers.

Five milling cutters are furnished with each machine. Will cut with one operation the same sizes as No. 1.

No. 2 Price each.....\$100.00

Weight, net, 200 pounds.



STANDARD KEY SEATS

Where key seats are required in shafting, pulleys, wheels, etc., we will cut them according to the following standard list unless otherwise ordered.

Diameter of Shaft, inches	Width of Key Seat "B," inch	Diameter of Shaft, inches	Width of Key Seat "B," inch
1 1/4 to 1 1/2	3/4	3 1/2 to 4 1/2	1
1 1/2 to 1 3/4	1 1/8	4 1/2 to 4 3/4	1 1/8
1 3/4 to 2	1 1/4	4 3/4 to 5	1 1/4
2 to 2 1/4	1 1/2	5 to 5 1/8	1 1/2
2 1/4 to 2 1/2	1 3/4	5 1/8 to 5 1/2	1 3/4
2 1/2 to 2 3/4	2	5 1/2 to 6	2
2 3/4 to 3	2 1/8	6 to 6 1/8	2 1/8
3 to 3 1/4	2 1/4	6 1/8 to 7	2 1/4

PRICE LIST FOR KEY SEATING SHAFTING

Diameter of Shaft	Key Seat for Coupling Each End	Key Seats, One Foot Long or Less	Each Additional Foot or Fraction of Foot
1 1/4	\$0.53	\$0.68	\$0.25
1 1/2	.53	.68	.25
1 3/4	.60	.68	.30
2	.60	.75	.35
2 1/4	.60	.75	.35
2 1/2	.68	.82	.45
2 3/4	.68	.82	.45
3	.75	1.00	.70
3 1/4	.82	1.25	.75
3 1/2	.82	1.25	.75
3 3/4	1.07	1.40	.90

ADJUSTABLE BALL AND SOCKET DROP HANGERS

With Standard, Capillary, Chain, or Ring Oil Bearing



FRAME

With Removable Double Brace Links

Bearings are Interchangeable



Standard Bearing



Capillary Bearing



Ring-Oiling Bearing



Chain-Oiling Bearing

STANDARD BEARING Price Each

Size of Shaft	DROP IN INCHES									
	8	10	12	14	16	18	20	24	30	36
$\frac{1}{16}$	\$ 3.85	\$ 4.00	\$ 4.20	\$ 4.45	.....	.....	.....	.....	.....	.....
$\frac{1}{8}$	3.95	4.10	4.30	4.55	.....	.....	.....	.....	.....	.....
$\frac{1}{4}$	4.90	5.05	5.25	5.50	\$ 5.60	\$ 6.00	\$ 6.45	.....	.....	.....
$\frac{3}{8}$	5.00	5.15	5.35	5.60	5.70	6.10	6.55	.....	.....	.....
$\frac{1}{2}$	6.85	7.35	7.50	7.80	8.05	8.30	8.80	\$ 9.65	.....	.....
$\frac{5}{8}$	8.70	9.05	9.20	9.70	10.30	10.75	11.65	13.35	\$15.70	\$18.25
$\frac{3}{4}$	9.35	9.70	9.85	10.35	10.95	11.40	12.30	14.00	16.35	18.90
$2 \frac{1}{16}$	10.85	11.35	11.85	12.35	13.35	14.45	15.50	17.75	19.80	20.55
$2 \frac{1}{8}$	12.80	13.30	13.80	14.30	15.30	16.40	17.45	19.70	21.75	22.50
$2 \frac{1}{4}$	.....	16.40	16.95	17.70	18.20	19.60	21.50	24.70	27.80	30.30
$2 \frac{3}{8}$	.....	16.85	17.40	18.15	18.65	20.05	21.95	25.15	28.25	30.75
$2 \frac{1}{2}$	.....	22.85	23.40	23.90	26.05	26.80	28.70	33.95	37.40	41.95
$3 \frac{1}{16}$	.....	26.10	26.65	27.15	29.30	30.05	31.95	37.20	40.65	45.20
$3 \frac{1}{8}$	.....	.....	.....	.....	32.70	34.95	37.20	42.45	45.25	51.20
$3 \frac{1}{4}$	.....	.....	.....	32.00	33.95	36.20	38.45	43.70	46.50	52.45
$3 \frac{3}{8}$	.....	.....	.....	.....	39.35	43.05	45.30	48.90	53.10	61.20
$4 \frac{1}{16}$	.....	.....	.....	.....	42.40	46.10	48.35	51.95	56.15	64.25

CAPILLARY BEARING Price Each

Size of Shaft	DROP IN INCHES									
	8	10	12	14	16	18	20	24	30	36
$\frac{1}{16}$	\$ 4.80	\$ 4.95	\$ 5.15	\$ 5.40	.....	.....	.....	.....	.....	.....
$\frac{1}{8}$	4.95	5.10	5.30	5.55	.....	.....	.....	.....	.....	.....
$\frac{1}{4}$	5.70	5.85	6.05	6.30	\$ 6.40	\$ 6.80	\$ 7.25	.....	.....	.....
$\frac{3}{8}$	5.95	6.10	6.30	6.55	6.65	7.05	7.50	.....	.....	.....
$\frac{1}{2}$	8.75	9.25	9.40	9.70	9.95	10.20	10.70	\$11.55	.....	.....
$\frac{5}{8}$	10.70	11.05	11.20	11.70	12.30	12.75	13.65	15.35	\$17.70	\$20.25
$\frac{3}{4}$	11.30	11.65	11.80	12.30	12.90	13.35	14.25	15.95	18.30	20.85
$2 \frac{1}{16}$	13.45	13.95	14.45	14.95	15.95	17.05	18.10	20.35	22.40	23.15
$2 \frac{1}{8}$	16.20	16.70	17.20	17.70	18.70	19.80	20.85	23.10	25.15	25.90
$2 \frac{1}{4}$	.....	24.70	25.25	26.00	26.50	27.90	29.80	33.00	36.10	38.60
$2 \frac{3}{8}$	.....	27.05	27.60	28.35	28.85	30.25	32.15	35.35	38.45	40.95
$2 \frac{1}{2}$	.....	30.45	32.00	32.50	34.65	35.40	37.30	42.55	46.00	50.55
$3 \frac{1}{16}$	.....	32.20	33.75	34.25	36.40	37.15	39.05	44.30	47.75	52.30

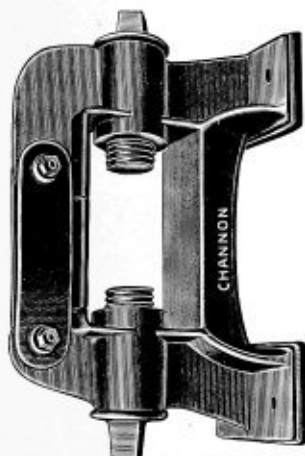
RING-OILING AND CHAIN OILING BEARINGS Price Each

Size of Shaft	DROP IN INCHES									
	8	10	12	14	16	18	20	24	30	36
$\frac{1}{16}$	\$ 5.15	\$ 5.30	\$ 5.50	\$ 5.75	.....	.....	.....	.....	.....	.....
$\frac{1}{8}$	5.90	6.05	6.25	6.50	\$ 6.60	\$ 7.00	\$ 7.45	.....	.....	.....
$\frac{1}{4}$	6.15	6.30	6.50	6.75	6.85	7.25	7.70	.....	.....	.....
$\frac{3}{8}$	9.00	9.50	9.65	9.95	10.20	10.45	10.95	\$11.80	.....	.....
$\frac{1}{2}$	10.95	11.30	11.45	11.95	12.55	13.00	13.90	15.60	\$17.95	\$20.50
$\frac{5}{8}$	11.60	11.95	12.10	12.60	13.20	13.65	14.55	16.25	18.60	21.15
$\frac{3}{4}$	13.80	14.30	14.80	15.30	16.30	17.40	18.45	20.70	22.75	23.50
$2 \frac{1}{16}$	16.55	17.05	17.55	18.05	19.05	20.15	21.20	23.45	25.50	26.25
$2 \frac{1}{8}$	.....	25.10	25.65	26.40	26.90	28.30	30.20	33.40	36.50	39.00
$2 \frac{1}{4}$	.....	27.55	28.10	28.85	29.35	30.75	32.65	35.85	38.95	41.45
$2 \frac{3}{8}$	.....	31.00	32.55	33.05	35.20	35.95	37.85	43.10	46.55	51.10
$2 \frac{1}{2}$	.....	32.80	34.35	34.85	37.00	37.75	39.65	44.90	48.35	52.90
$3 \frac{1}{16}$	.....	.....	.....	38.20	40.15	42.40	44.65	49.90	52.70	58.65
$3 \frac{1}{8}$	.....	.....	.....	40.95	44.90	45.15	47.40	52.65	55.45	61.40
$3 \frac{1}{4}$	.....	.....	.....	.....	50.60	54.30	56.55	60.15	64.35	72.45
$3 \frac{3}{8}$	.....	.....	.....	.....	55.75	59.45	61.70	65.30	69.50	77.60

HEAVY HEAD SHAFT HANGERS

Ring or Chain Bearing

The Standard Drops are 12 and 18 inches. By use of shoes additional drops of 2, 4 and 6 inches may be obtained with each frame.



Showing Frame Only, with Removable Double Brace Links

Size Shaft, inches	Frame, 12 inch Drop	WITH SHOE TO MAKE DROP		
		14 inches	16 inches	18 inches
2 $\frac{1}{16}$	\$ 24.80	\$ 36.95	\$ 42.65	\$ 47.90
2 $\frac{1}{8}$	25.60	37.75	43.45	48.70
2 $\frac{3}{16}$	27.20	39.35	45.05	50.30
2 $\frac{1}{2}$	28.35	40.50	46.20	51.45
3 $\frac{1}{16}$	41.10	58.05	64.50	70.95
3 $\frac{1}{8}$	42.00	58.95	65.40	71.85
3 $\frac{3}{16}$	43.20	60.15	66.60	73.05
3 $\frac{1}{2}$	44.35	61.30	67.75	74.20
4 $\frac{1}{16}$	53.20	74.05	81.55	89.95
4 $\frac{1}{8}$	64.50	85.35	92.85	101.25
4 $\frac{3}{16}$	65.60	86.45	93.95	102.35
4 $\frac{1}{2}$	66.90	87.75	95.25	103.65
5 $\frac{1}{16}$	86.70	112.50	120.90	130.95
5 $\frac{1}{8}$	93.60	119.40	127.80	137.85

ADJUSTABLE BALL AND SOCKET POST HANGERS Standard and Self-Oiling Bearings. All Bearings are Interchangeable

Shaft, inches	STYLE OF BEARING		
	Standard	Capillary	Ring or Chain
1 $\frac{1}{16}$	\$ 4.40	\$ 5.35	.....
1 $\frac{1}{8}$	4.50	5.50	\$ 5.70
1 $\frac{1}{4}$	5.50	6.30	6.50
1 $\frac{3}{8}$	5.60	6.55	6.75
1 $\frac{1}{2}$	7.15	9.05	9.30
2 $\frac{1}{16}$	9.75	11.75	12.00
2 $\frac{1}{8}$	10.40	12.35	12.65
2 $\frac{3}{16}$	13.00	15.60	15.95
2 $\frac{1}{2}$	14.95	18.35	18.70
3 $\frac{1}{16}$	19.00	27.30	27.70
3 $\frac{1}{8}$	19.45	29.65	30.15
3 $\frac{3}{16}$	25.45	34.05	34.60
3 $\frac{1}{2}$	28.70	35.80	36.40
4 $\frac{1}{16}$	32.85	.....	40.30
4 $\frac{1}{8}$	34.10	.....	43.05
4 $\frac{3}{16}$	43.35	.....	54.60
4 $\frac{1}{2}$	46.40	.....	59.75

SHORT HEAD SHAFT HANGER OR ADJUSTABLE PILLOW BLOCKS By Inverting Frame can be used either as Hanger or Pillow Block Standard and Self-Oiling Bearings

Size, inches	PRICE EACH, WITHOUT BASE-PLATE		
	Standard Oiling	Capillary Oiling	Chain or Ring Oiling
1 $\frac{1}{16}$	\$ 4.45	\$ 5.25	\$ 5.45
1 $\frac{1}{8}$	4.55	5.50	5.70
1 $\frac{1}{4}$	6.65	8.55	8.80
2 $\frac{1}{16}$	8.70	10.70	10.95
2 $\frac{1}{8}$	9.35	11.30	11.60
2 $\frac{3}{16}$	10.45	16.05	16.40
2 $\frac{1}{2}$	15.40	18.80	19.15
3 $\frac{1}{16}$	19.55	27.85	28.25
3 $\frac{1}{8}$	20.00	30.20	30.70
3 $\frac{3}{16}$	26.75	35.35	35.90
3 $\frac{1}{2}$	30.00	37.10	37.70
4 $\frac{1}{16}$	34.65	.....	42.10
4 $\frac{1}{8}$	35.90	.....	44.85
4 $\frac{3}{16}$	42.50	.....	53.75
4 $\frac{1}{2}$	45.55	.....	58.90

COMMON FLAT BOXES

Lubrication is provided for by means of a Cup Reservoir in the Cap

Size Shaft, inches	Price Each	Size Shaft, inches	Price Each	Size Shaft, inches	Price Each
1 $\frac{1}{16}$	\$1.00	2 $\frac{1}{16}$	\$2.80	3 $\frac{1}{16}$	\$ 6.20
1 $\frac{1}{8}$	1.35	2 $\frac{1}{8}$	3.40	3 $\frac{1}{8}$	7.60
1 $\frac{1}{4}$	1.65	2 $\frac{1}{4}$	4.10	3 $\frac{1}{4}$	9.50
1 $\frac{3}{8}$	2.00	2 $\frac{3}{8}$	5.00	3 $\frac{3}{8}$	11.00
1 $\frac{1}{2}$	2.30				



HEAVY RIGID POST BEARINGS

For Supporting Heavy Line Shaft to Posts



Showing Self-Oiling

Shaft, inches	STYLE OF BEARING		
	Standard	Capillary	Chain or Ring
1 $\frac{1}{16}$	\$ 3.60	\$ 4.40	\$ 4.70
1 $\frac{1}{8}$	4.10	5.05	5.35
1 $\frac{1}{4}$	5.45	6.70	7.00
2 $\frac{1}{16}$	7.25	8.80	9.10
2 $\frac{1}{8}$	8.35	11.35	11.65
2 $\frac{1}{4}$	9.15	14.30	14.65
2 $\frac{3}{8}$	10.35	17.60	17.95
3 $\frac{1}{16}$	12.70	21.00	21.40
3 $\frac{1}{8}$	14.10	24.35	24.85
3 $\frac{1}{4}$	18.40	28.00	28.55
3 $\frac{3}{8}$	22.40	31.50	32.10
4 $\frac{1}{16}$	27.15	.....	38.55
4 $\frac{1}{8}$	31.90	.....	45.00
4 $\frac{1}{4}$	40.10	.....	51.45

RIGID PILLOW BLOCKS

Standard and Self-Oiling Bearings, for Heavy Duty or High Speed

Size Shaft, inches	STYLE OF BEARING		
	Standard	Capillary	Ring or Chain
1 $\frac{1}{16}$	\$ 1.30	.....	.....
1 $\frac{1}{8}$	1.60	\$ 3.00	\$ 4.50
1 $\frac{1}{4}$	2.10	3.50	5.00
1 $\frac{3}{8}$	2.70	4.20	5.70
1 $\frac{1}{2}$	3.70	5.20	6.80
2 $\frac{1}{16}$	4.60	6.30	8.20
2 $\frac{1}{8}$	5.50	7.50	9.80
2 $\frac{1}{4}$	7.00	9.00	12.00
2 $\frac{3}{8}$	8.80	11.00	14.00
3 $\frac{1}{16}$	11.00	15.00	18.00
3 $\frac{1}{8}$	12.80	18.00	22.00
3 $\frac{1}{4}$	14.40	22.00	27.00
3 $\frac{3}{8}$	16.00	26.00	32.00

BALL AND SOCKET PILLOW BLOCKS

Standard and Self-Oiling Bearing.

Size Shaft, inches	STYLE OF BEARING		
	Standard	Capillary	Ring or Chain
1 $\frac{1}{16}$	\$ 3.30	\$ 4.30	\$ 5.80
1 $\frac{1}{8}$	3.90	4.90	6.40
1 $\frac{1}{4}$	4.60	5.60	7.10
1 $\frac{3}{8}$	5.60	6.60	8.20
2 $\frac{1}{16}$	7.00	8.00	10.00
2 $\frac{1}{8}$	9.00	10.30	12.60
2 $\frac{1}{4}$	11.50	13.00	16.00
2 $\frac{3}{8}$	14.00	16.00	19.00
3 $\frac{1}{16}$	17.00	20.00	23.00
3 $\frac{1}{8}$	21.00	25.00	29.00
3 $\frac{1}{4}$	25.00	30.00	35.00
3 $\frac{3}{8}$	30.00	35.00	41.00

SOLID JOURNAL OR POST BEARINGS

To be Used Where Power is Light or Speed Slow

Shaft, inches	PRICE EACH		Shaft, inches	PRICE EACH		Shaft, inches	PRICE EACH	
	Bored	Rab-bit		Bored	Rab-bit		Bored	Rab-bit
1 $\frac{1}{16}$	\$0.75	\$ 0.95	2 $\frac{1}{16}$	\$2.60	\$2.70	3 $\frac{1}{16}$	\$ 6.00	\$ 5.90
1 $\frac{1}{8}$	.90	1.20	2 $\frac{1}{8}$	3.25	3.20	3 $\frac{1}{8}$	7.25	7.30
1 $\frac{1}{4}$	1.25	1.50	2 $\frac{1}{4}$	4.00	3.60	3 $\frac{1}{4}$	8.50	9.00
1 $\frac{3}{8}$	1.60	1.80	2 $\frac{3}{8}$	5.00	4.80	3 $\frac{3}{8}$	10.00	11.00
1 $\frac{1}{2}$	2.00	2.10						



Showing Style up to and including 2 1/2 inch Shaft



Showing Style with Standard Bearings



**SOLID SLEEVE COUPLINGS**

For Light Shafting

Have countersunk set screws, and are finished over entire surface.

Size, inches	$\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{15}{16}$
Price, each	\$3.00	\$3.50	\$3.75	\$4.00	\$4.50	\$5.50

FLANGE OR PLATE COUPLINGS

Finished all over, key-seated and keys furnished; they have finished bolts fitted to reamed holes. Reducing Couplings charged at the rate of the larger size.

Price List, Per Pair, Including Keys

Size Shaft, inches..	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Price, Not Fitted..	\$7.50	\$8.00	\$8.50	\$9.00	\$10.50	\$12.50	\$15.25	\$18.25	\$21.75
Price, Fitted	9.90	10.50	11.10	11.75	13.40	15.60	18.50	21.75	25.75
Size Shaft, inches..	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{1}{2}$	6
Price, Not Fitted..	\$25.25	\$29.25	\$33.25	\$38.25	\$43.25	\$49.00	\$54.75	\$67.00	\$81.00
Price, Fitted.....	29.75	34.25	39.25	45.00	51.25	57.75	64.75	78.00	93.00

Price Fitted includes key-seating shafts, fitting and facing couplings on same.

RIBBED COMPRESSION COUPLINGS

Complies with all legal requirements as to safety by having bolt heads and nuts protected. This Coupling, when securely clamped to the shaft without key, develops marked driving efficiency.

Reducing Couplings charged at the rate of the larger size.

Price List, Including Keys

Size Shaft, inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Price, Each	\$3.05	\$4.20	\$6.30	\$7.40	\$9.00	\$10.00	\$11.00
Size Shaft, inches.....	$2\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$
Price, Each.....	\$13.00	\$16.50	\$20.00	\$24.00	\$28.00	\$32.00	\$38.00

Larger Than $2\frac{1}{4}$ inches**SHAW PATENT COMPRESSION FLANGE COUPLING**

Single Compression

Sizes $2\frac{1}{4}$ inch and Smaller

Size Shaft, in...	$\frac{1}{2}$ to $\frac{1}{4}$	1	$1\frac{1}{4}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to $1\frac{3}{4}$	$1\frac{3}{4}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to 2	$2\frac{1}{8}$ to $2\frac{1}{4}$	$2\frac{1}{4}$ to $2\frac{1}{2}$	$2\frac{1}{2}$ to $2\frac{3}{4}$
Price, Each....	\$3.00	\$4.25	\$4.75	\$5.00	\$5.50	\$6.25	\$8.00	\$9.00	\$10.75
Size Shaft, in...	$2\frac{1}{2}$ to 3	$3\frac{1}{4}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to $3\frac{3}{4}$	$3\frac{3}{4}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to 4	$4\frac{1}{8}$ to $4\frac{1}{4}$	$4\frac{1}{4}$ to $4\frac{1}{2}$	$4\frac{1}{2}$ to 5	$5\frac{1}{8}$ to $5\frac{1}{4}$
Price, Each....	\$27.25	\$32.50	\$39.25	\$45.25	\$51.25	\$61.50	\$71.75	\$83.00	\$91.00

Reducing Couplings, advance 10 per cent on above prices.

SAFETY SET COLLARS

Made in all sizes—solid and split. To comply with all legal requirements as to safety by having set screws and bolts protected. Finished and polished on periphery and faced on ends.



Solid

For Prices of Split Collars, add 50 per cent to List Price.



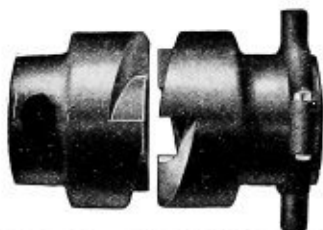
Split

Size	$\frac{1}{8}$	1	$1\frac{1}{4}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to $1\frac{3}{4}$	$1\frac{3}{4}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to 2	$2\frac{1}{8}$ to $2\frac{1}{4}$	$2\frac{1}{4}$ to $2\frac{1}{2}$	$2\frac{1}{2}$ to $2\frac{3}{4}$
Each	\$0.65	\$0.65	\$0.80	\$1.00	\$1.20	\$1.40	\$1.60	\$1.80	\$2.10
Size	$2\frac{1}{2}$ to 3	$3\frac{1}{4}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to $3\frac{3}{4}$	$3\frac{3}{4}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to 4	$4\frac{1}{8}$ to $4\frac{1}{4}$	$4\frac{1}{4}$ to $4\frac{1}{2}$	$4\frac{1}{2}$ to 5	$5\frac{1}{8}$ to $5\frac{1}{4}$
Each	\$2.40	\$2.70	\$3.00	\$3.30	\$3.60	\$4.15	\$4.70	\$5.30	\$5.90

JAW CLUTCH COUPLINGS



Standard Square Jaw. Jaws Planed

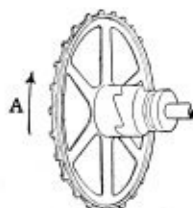


Spiral Jaw. Furnished Right or Left Hand

Shaft Size, inches	Price Square or Spiral	LEVER		Charge for Fitting to Shaft	Price Complete
		Std. Length, inches	Price		
$1\frac{1}{2}$	\$ 6.50	48	\$1.50	\$ 3.00	\$ 11.00
$1\frac{7}{16}$	7.00	48	1.50	3.00	11.50
$1\frac{1}{2}$	8.00	48	1.50	4.00	13.50
$1\frac{11}{16}$	8.50	48	1.50	4.25	14.25
$1\frac{13}{16}$	9.00	54	1.65	4.50	15.15
$2\frac{1}{16}$	11.25	54	1.75	4.50	17.50
$2\frac{7}{16}$	14.25	54	2.40	4.50	21.15
$2\frac{11}{16}$	18.50	54	2.40	4.75	25.65
$2\frac{13}{16}$	22.75	54	2.40	5.00	30.15
$3\frac{1}{16}$	30.00	54	2.40	7.50	39.90
$3\frac{13}{16}$	39.00	60	3.25	9.75	52.00
$4\frac{1}{16}$	52.00	60	3.25	13.50	68.75
5	70.00	66	4.10	17.00	91.10
$5\frac{1}{2}$	95.00	66	4.10	20.00	119.10
6	130.00	72	5.10	25.00	160.10

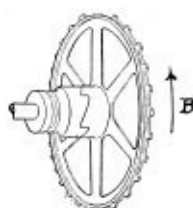
Price complete, includes:—Clutch, thrust collar, feather key, shifter yoke and lever, "F" ring and fitting to shaft.

DIFFERENT ARRANGEMENTS OF SPIRAL JAW CLUTCHES

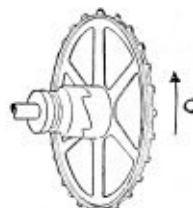


Right-Hand

Clutch Driving Wheel

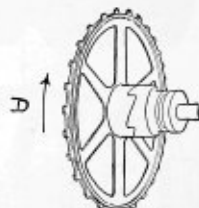


Left-Hand



Right-Hand

Wheel Driving Clutch



Left-Hand

In ordering pulleys, gears, or sprocket wheels with spiral jaw clutch hubs, please use letters A, B, C, etc., to indicate desired arrangement.

IMPROVED UNIVERSAL JOINT COUPLINGS



Single



Double

Size of shaft, inches	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$
List Price each, Single	\$ 50.00	60.00	70.00	75.00	80.00	85.00	95.00	120.00	150.00
" " " Double	100.00	120.00	140.00	150.00	160.00	170.00	190.00	240.00	300.00

BASE OF SOLE PLATES

For Pillow Blocks



Plain



Adjustable

PLAIN

The plain type is finished on top and provides for horizontal adjustment only, same being from one to two inches.

ADJUSTABLE

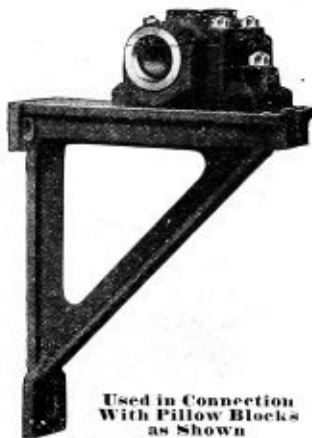
Finished and fitted with a set of wedges operated by set screws giving a vertical adjustment of $\frac{3}{4}$ inch; horizontal adjustment 1 to 2 inches.

Size Shaft	PRICE, EACH		Size Shaft	PRICE, EACH	
	Plain	Adjustable		Plain	Adjustable
1 1/2	\$ 4.25	\$ 6.50	2 1/2	\$11.00	\$16.50
2	4.85	7.30	3	12.00	18.00
2 1/2	5.95	8.90	3 1/2	17.35	26.00
3	6.80	10.20	4	21.00	31.50
3 1/2	8.10	12.10	5	26.40	39.00
4	10.00	15.00	6	30.60	45.00

EXTENSION WALL BRACKETS

With Slots and Planed Tops

Size of Shafts	Distance from Wall to Center of Shaft	Price, Each
1¾ to 2½	12	\$ 8.60
	18	11.80
	24	16.60
	30	19.60
	36	24.20
2¾ to 3½	12	13.90
	18	19.90
	24	25.90
	30	31.90
	36	37.70
3¾ to 4½	12	18.70
	18	26.20
	24	33.60
	30	41.00
	36	48.40
4¾ to 5½	18	30.60
	24	38.60
	30	48.60



**Used in Connection
With Pillow Blocks
as Shown**

MULE PULLEY STANDS

STATIONARY

Complete with Ceiling Plate, Cup Collars, Guy Rods, and Iron Pulleys.

For 2 inch Belt, with 2 Pulleys, 10x 3 inches.	\$22.50
3 " " " " " " " " " " " "	25.00
4 " " " " " " " " " " " "	30.00
5 " " " " " " " " " " " "	32.00
6 " " " " " " " " " " " "	37.50
7 " " " " " " " " " " " "	40.00
8 " " " " " " " " " " " "	45.00
9 " " " " " " " " " " " "	55.00
10 " " " " " " " " " " " "	65.00

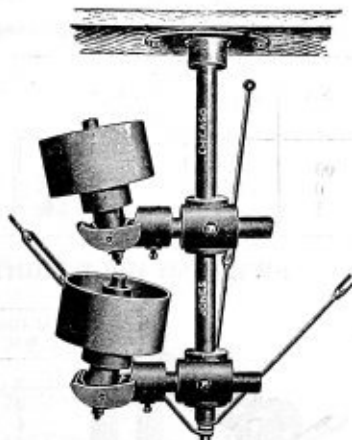
ADJUSTABLE

Price includes One Shaft, Two Pulleys, Two Adjustable Arms, Top Plate and Guy Rods.

For 4 inch Belt, with 2 Pulleys, 12x 5 inches.....	\$ 60.00
" 5 " " " " " " " " " " " "	62.00
" 6 " " " " " " " " " " "	75.00
" 7 " " " " " " " " " " "	78.00
" 8 " " " " " " " " " " "	85.00
" 10 " " " " " " " " " " "	112.00
" 12 " " " " " " " " " " "	160.00



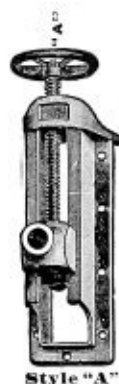
Stationary



Adjustable
For use where two shafts are not
on the same plane

STANDARD TAKE-UP BOXES

For Taking Up Slack in Belts, as in Elevators. Made to Pull and Push



Style "A"

No. of Frame	Diameter of Shaft	Price, Each, "A" or "B"	No. of Frame	Diameter of Shaft	Price, Each, "A" or "B"
4	1 1/16	\$1.75	12	2 5/16	\$ 6.25
4	1 3/16	1.90	12	2 7/16	6.75
4	1 1/2	2.00	20	2 9/16	9.50
5	1 5/16	2.55	20	2 11/16	10.00
5	1 7/16	2.70	20	2 13/16	11.00
7	1 9/16	3.25	20	2 15/16	13.50
7	1 11/16	3.50	24	3 1/16	15.00
7	1 13/16	4.00	36	3 1/2	20.00
9	1 15/16	4.75	48	3 5/8	35.00
9	2 1/16	5.00	60	3 3/4	40.00

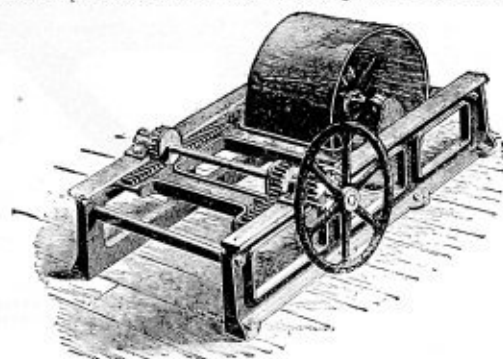
The number of frame indicates length of movement in inches. In ordering give diameter of shaft and style desired.



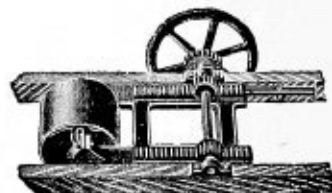
Style "B"

BELT TIGHTENERS

Our Belt Tighteners are strong, well made, and have accurately balanced pulleys.
A complete stock is carried in Chicago from which orders can be promptly shipped.

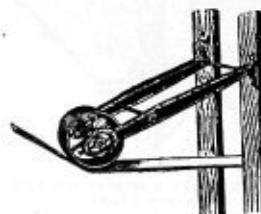


With Iron Side Frames Furnished Complete as Shown

Belt Tightener for
Wooden Frame.
Wood Frame Not Furnished

No.	Length of Adjustment, feet	Size of Pulley, Diam. Face	Diam. of Shaft	Price With Iron Side Frames	Price Without Iron Frame	No.	Length of Adjustment, feet	Size of Pulley, Diam. Face	Diam. of Shaft	Price With Iron Side Frames	Price Without Iron Frame
00	1 1/2	12x9	1 1/16	\$37.50	\$30.00	2	3 1/2	28x20	2 1/16	\$100.00	\$ 82.00
0	1 3/4	18x12	1 3/16	50.00	40.00	3	4	30x26	2 3/16	160.00	120.00
1	2	24x14	1 1/2	70.00	56.00	4	5	42x38	2 1/2	300.00	250.00

SWINGING BELT TIGHTENER



Motion, feet	Size of Pulley	Price Each
3	12 x 8	\$30.00
3	12 x 10	35.00
4	20 x 14	40.00
4	24 x 15	45.00
5	28 x 20	50.00
5	30 x 26	55.00

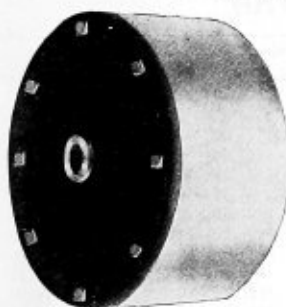
ADJUSTABLE IDLER



This Idler is swiveled and may be adjusted to any angle, can be placed upon floor or in hanging position.

Size of pulley 12x8 inches.
Price.....\$23.00

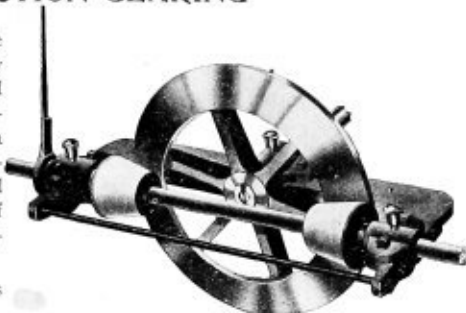
PAPER AND IRON FRICTION GEARING



Spur Frictions

Friction Gearing is desirable where machinery is frequently thrown in and out of gear, and for reverse motion, being engaged and disengaged by a slight movement of the lever attached to the eccentric or end thrust box, which forms one of the journal bearings, thus dispensing with a clutch.

The paper wheel must always be used as the driver.



Bevel Frictions

PRICE LIST SPUR PAPER FRICTION WHEELS COMPLETE WITH FLANGES

Diameter	Face	Price	Diameter	Face	Price	Diameter	Face	Price	Diameter	Face	Price
4	4	\$2.60	10	6	\$ 8.60	14	8	\$16.96	18	14	\$35.58
4	6	3.42	10	8	10.58	14	10	20.16	18	16	40.16
4	8	4.26	10	10	12.64	14	12	23.26	18	18	33.46
6	4	3.28	10	12	14.62	14	14	26.38	20	12	38.24
6	6	4.30	10	14	16.60	16	8	20.06	20	14	43.04
6	8	5.32	12	6	10.72	16	10	23.84	20	16	47.82
8	4	4.58	12	8	13.20	16	12	27.50	24	10	46.04
8	6	6.04	12	10	15.74	16	14	31.44	24	12	52.14
8	8	7.52	12	12	18.20	18	10	27.68	24	14	58.24
8	10	9.10	12	14	20.68	18	12	31.78	24	16	64.14

Prices of other sizes, also bevel and mitre frictions quoted upon request.

When ordering—give diameter and face of paper bore, of hub and size of Key seat. For Bevel and Mitre state large diameter, width of face and degree of angle.

PRICE LIST SPUR IRON FRICTION WHEELS

Diameter	Face	Price	Diameter	Face	Price	Diameter	Face	Price	Diameter	Face	Price
12	4	\$ 5.88	20	10	\$17.92	30	10	\$30.24	40	14	\$ 62.72
12	6	7.36	20	12	21.00	30	12	35.70	44	10	54.12
12	8	9.90	20	14	24.36	30	14	41.58	44	12	62.86
12	10	10.68	24	6	14.92	36	8	33.18	44	14	72.24
16	4	7.42	24	8	18.76	36	10	39.62	44	16	81.90
16	6	9.58	24	10	22.68	36	12	46.34	48	10	62.24
16	8	11.48	24	12	26.60	36	14	53.98	48	12	72.10
16	10	13.86	24	14	30.80	40	8	39.34	48	14	82.60
20	6	12.04	30	6	29.28	40	10	46.62	48	16	93.38
20	8	14.84	30	8	35.20	40	12	54.26	48	18	104.50

Other sizes quoted upon request.

FRICTION TRANSMISSION BOXES



Fig. 90

Fig. 90—Eccentric Box for engaging Spur Frictions.

Fig. 100—Quick Acting End Thrust Box used when frictions are frequently engaged and disengaged, also for reverse motions.

Diam. Shaft, in. 1 1/4 1 1/2 1 3/4 2 1/4 2 1/2 2 3/4 3 1/4

Price Fig. 90 \$7.50 \$ 8.15 \$10.65 \$12.10 \$13.75 \$15.65 \$17.85 \$20.40

Price Fig. 100 9.75 10.60 13.85 15.75 17.90 20.35 23.20 26.65

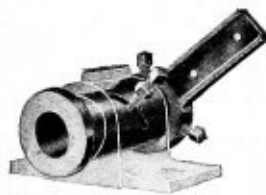


Fig. 100

Rules for Calculating Horse Power and Dimensions of Frictions

D=Diameter in inches; F=Width Face, inches; N=Revolutions per Minute; H. P.=Horse Power.

Given D, F and N to find H. P. :—

$$D \times F \times N \times .000238 = H. P.$$

Given F, N and H. P. to find D :—

$$\frac{H. P.}{F \times N \times .000238} = D$$

Use Mean diameter for Mitre or Bevel Frictions.

Given N, H. P. and D to find F :—

$$\frac{H. P.}{N \times D \times .000238} = F$$

Given H, P., D and F to find N :—

$$\frac{H. P.}{D \times F \times .000238} = N$$

SPUR



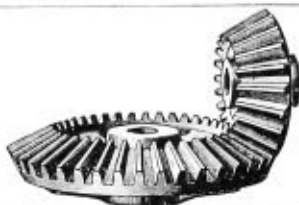
GEARING

No. of Pattern	No. of Teeth	Diameter	Face	Pitch, inches	Price	No. of Pattern	No. of Teeth	Diameter	Face	Pitch, inches	Price	No. of Pattern	No. of Teeth	Diameter	Face	Pitch, inches	Price
20	15	2.44	1	1/2	\$1.35	226	11	3.50	2 1/2	1	\$2.00	524	115	46.16	3 1/4	1 1/2	\$23.00
139	16	2.55	1 1/4	1/2	1.40	109	12	3.82	"	"	2.10	82	10	4.88	3	1 1/8	3.00
161	18	2.86	"	"	1.50	144	13	4.14	"	"	2.20	202	14	6.13	3 1/2	"	3.30
21	24	3.82	1	"	1.80	151	14	4.46	"	"	2.30	83	68	29.26	3	"	16.00
135	12	2.39	1 1/2	3/8	1.50	16	15	4.77	"	"	2.40	203	98	42.90	3 1/2	"	22.00
22	13	2.59	1 1/4	"	1.55	129	16	5.09	"	"	2.50	162	10	4.77	4	1 1/2	3.15
153	15	2.98	"	"	1.65	107	18	5.73	"	"	2.70	126	12	5.73	"	"	3.75
23	16	2.98	"	"	1.70	119	20	6.37	"	"	2.90	126	13	6.21	5	"	4.70
141	20	3.98	"	"	1.90	140	21	6.68	"	"	3.05	138	14	6.68	4	"	4.25
24	28	4.77	"	"	2.35	30	26	8.28	2	"	3.60	101	15	7.16	"	"	4.50
500	30	5.98	1 1/2	"	2.45	207	30	9.55	3	"	4.25	117	16	7.64	4 1/2	"	4.80
234	37	7.36	"	"	2.80	110	36	11.46	2 1/2	"	4.85	102	18	8.59	"	"	5.15
221	38	7.56	"	"	2.85	137	37	11.78	"	"	5.00	526	19	9.11	4	"	5.70
111	45	8.95	"	"	3.15	15	50	15.92	"	"	6.60	164	20	9.55	"	"	5.85
219	65	12.93	"	"	3.15	504	55	17.51	"	"	7.25	528	22	10.54	4 1/2	"	6.45
18	13	3.10	3	3/4	2.50	505	56	17.82	"	"	7.40	247	23	10.98	4	"	6.75
209	13	3.10	1 1/4	"	1.65	120	60	19.11	"	"	7.90	165	24	11.46	"	"	7.00
108	14	3.34	"	"	1.75	120	63	20.05	3	"	8.50	216	26	12.44	"	"	7.55
262	15	3.58	"	"	1.85	508	66	21.09	"	"	8.75	237	28	13.37	3 1/2	"	8.00
25	16	3.82	1 1/4	"	1.90	159	72	22.92	2 1/2	"	9.25	166	29	13.85	4	"	8.30
26	17	4.06	"	"	2.00	17	75	23.87	"	"	9.65	104	36	17.19	"	"	10.25
27	18	4.32	"	"	2.10	509	76	24.20	"	"	10.00	533	44	21.01	"	"	12.50
71	20	4.78	2	"	2.15	147	88	28.01	"	"	11.25	167	45	21.49	"	"	12.65
263	21	5.01	1 1/4	"	2.20	148	100	31.83	"	"	12.75	116	46	21.96	"	"	12.90
154	24	5.73	"	"	2.30	111	141	36.30	"	"	14.50	103	50	23.87	"	"	14.00
155	25	5.97	"	"	2.50	78	9	3.22	3 1/2	1 1/8	2.00	215	53	25.30	"	"	14.85
28	28	6.70	2	"	2.75	79	11	3.99	2 1/2	"	2.25	530	60	28.65	"	"	15.65
264	33	7.88	1 1/4	"	2.95	10	14	5.05	2	"	2.50	131	63	30.25	"	"	16.75
501	37	8.83	"	"	3.10	80	15	5.37	"	"	2.60	128	65	31.05	"	"	17.75
152	39	9.31	"	"	3.25	127	14	5.01	"	"	2.50	130	72	34.38	"	"	18.50
19	40	9.55	"	"	3.75	512	22	7.88	2 1/2	"	4.00	128	83	39.63	"	"	20.00
19	40	9.55	2 1/2	"	3.75	512	22	7.88	2 1/2	"	4.00	128	83	39.63	"	"	23.00
29	42	10.04	"	"	3.95	214	29	10.38	"	"	4.75	248	86	41.08	"	"	26.50
156	46	10.98	1 1/4	"	4.25	513	96	34.38	"	"	19.50	210	96	45.88	"	"	30.00
70	48	11.47	1 1/2	"	4.40	366	122	43.69	"	"	26.00	531	100	47.75	"	"	34.00
134	60	14.33	1 1/4	"	4.50	245	10	3.98	3 1/4	1 1/2	2.00	532	105	50.14	"	"	38.00
265	72	17.19	"	"	5.50	235	12	4.77	2	"	2.40	199	111	53.00	"	"	40.00
257	84	20.65	2	"	7.00	122	12	4.77	3 1/4	"	2.50	252	10	5.66	5	1 3/4	4.50
224	11	3.06	2 1/4	3/8	1.25	160	13	5.17	"	"	2.65	168	12	6.68	"	"	5.00
224	11	3.06	"	"	1.25	142	14	5.37	"	"	2.80	169	13	7.24	"	"	5.35
123	13	3.62	"	"	1.70	113	15	5.97	"	"	3.00	149	14	7.80	"	"	5.80
157	14	3.90	2	"	1.85	136	16	6.37	"	"	3.20	170	15	8.36	"	"	6.25
143	15	4.18	2 1/2	"	1.90	204	17	6.76	"	"	3.40	171	16	8.91	"	"	6.75
74	15	4.18	"	"	1.90	516	18	7.20	3	"	3.55	172	18	10.03	"	"	7.55
192	16	4.46	2 1/4	"	2.05	517	19	7.59	3 1/4	"	3.70	89	20	11.20	4	"	9.00
145	18	5.01	"	"	2.25	106	20	7.96	"	"	3.90	86	21	11.70	3 1/2	"	9.50
11	20	5.57	"	"	2.40	10	21	8.35	"	"	4.10	810	24	13.37	4	"	10.00
125	22	6.13	"	"	2.60	520	22	8.76	3	"	4.20	173	24	13.37	5	"	10.10
181	30	8.36	"	"	3.40	519	25	9.97	3 1/4	"	4.90	256	26	14.56	5 1/2	"	11.50
196	31	8.63	"	"	3.55	239	27	10.74	"	"	5.15	254	30	16.60	5	"	14.00
197	33	9.19	"	"	3.75	520	28	11.20	3	"	5.45	174	36	20.05	"	"	15.35
124	40	11.14	"	"	4.40	118	30	11.94	3 1/4	"	5.70	205	40	22.28	"	"	17.00
12	46	12.81	"	"	5.00	218	35	13.94	"	"	6.10	175	52	28.97	"	"	25.00
146	50	13.93	2 1/4	"	5.40	121	40	15.95	"	"	7.50	534	54	30.10	"	"	27.00
184	73	20.70	"	"	7.60	521	50	19.90	"	"	9.25	255	71	39.57	"	"	37.00
13	75	20.79	"	"	7.80	105	60	23.87	"	"	11.00	535	75	41.00	"	"	39.00
220	78	21.82	"	"	8.10	522	62	24.80	"	"	12.50	150	86	47.91	"	"	45.00
258	86	23.95	2	"	9.25	523	66	26.77	3	"	13.00	367	93	51.80	5	1 3/4	50.00
158	94	26.18	"	"	9.70	194	75	29.84	3 1/4	"	13.70	253	108	60.19	"	"	57.00
190	102	28.41	2 1/4	"	10.75	112	80	31.83	"	"	14.55	88	120	66.85	3 1/2	"	50.00
132	114	31.75	"	"	11.90	133	90	35.81	3 1/4	1 1/4	17.00	536	122	67.96	5 1/2	"	75.00
206	10	3.18	3 1/2	1	2.10	246	92	36.62	"	"	17.50	87	10	6.47	4 1/2	2	5.00
176	12	7.64	6	1 1/2	"	177	13	8.28	"	"	"	115	14	8.91	"	"	"
177	13	8.28	"	"	"	115	14	8.91	"	"	"	185	16	10.19	"	"	"
178	14	8.91	"	"	"	185	16	10.19	"	"	"	538	17	10.19	"	"	"
187	19	12.10	"	"	"	187	19	12.10	"	"	"	179	19	12.10	"	"	"
249	22	14.01	"	"	"	178	24	15.28	"	"	"	188	25	15.93	"	"	"
178	24	15.28	"	"	"	188	25	15.93	"	"	"	241	28	17.82	"	"	"
188	25	15.93	"	"	"	241	28	17.82	"	"	"	191	30	19.10	"	"	"
244	26	16.55	"	"	"	191	30	19.10	"	"	"	188	35	22.28	"	"	"
241	28	17.82	"	"	"	188	35	22.28	"	"	"	376	41	32.64	"	"	"
191	30	19.10	"	"	"	376	41	32.64	"	"	"	540	44	29.04	"	"	"
188	35	22.28	"	"	"	540	44	29.04	"	"	"	179	48	30.56	"	"	"
376	41	32.64	"	"	"	179	48	30.56	"	"	"	539	59	37.56	"	"	"
540	44	29.04	"	"	"	539	59	37.56	"	"	"	595	63	40.12	"	"	"
179	48	30.56	"	"	"	595	63	40.12	"	"	"	114	69	43.93	"	"	"
539	59	37.56	"	"	"	114	69	43.93	"	"	"	541	74	47.12	"	"	"
595	63	40.12	"	"	"	541	74	47.12	"	"	"	189	75	47.75	"	"	"
114	69	43.93	"	"	"	189	75	47.75	"	"	"	236	104	66.21	"	"	"
541	74	47.12	"	"	"	236	104	66.21	"	"	"	127	12	8.60	7 1/2	2 1/4	8.25
189	75	47.75	"	"	"	127	12	8.60	7 1/2	2 1/4	"	280	14	10.03	6 1/2	"	10.00
236	104	66.21	"	"	"	280	14	10.03	6 1/2	"	"	200	16	11.46	"	"	12.50
127	12	8.60	7 1/2	2 1/4	"	200	16	11.46	"	"	"	370	34	24.33	7 1/2	"	34.00
280	14	10.03	6 1/2	"	"	370	34	24.33	7 1/2	"	"	228	36	25.78	7	"	35.00
200	16	11.46	"	"	"	228	36	25.78	7	"	"	211	50	35.81	8 1/2	"	47.00
370	34	24.33	7 1/2	"	"	211	50	35.81	8 1/2	"	"	201	64	45.84	6 1/2	"	60.00
228	36	25.78	7	"	"	201	64	45.84	6 1/2	"	"	369	83	59.47	7	"	75.00
211	50	35.81	8 1/2	"	"	369	83	59									

BEVEL GEARING

A pair of Bevel Gears consists of two gears of different diameters running together at right angles, the smaller being called the pinion.

The "backing" is the distance the hub extends back of the pitch circle. Pitch for bevel gears is measured at large end of teeth.



No. of Patt.	No. of Teeth	Dia- me- ter	Face	Pitch, inch	Back- ing	Proportion	Price	No. of Patt.	No. of Teeth	Dia- me- ter	Face	Pitch, inch	Back- ing	Proportion	Price
388	24	3.83	1 1/4	3/8	1 1/4	1 to 1	\$ 1.75	476	76	30.40	3	1 1/4	3 1/2	4 to 1	\$12.50
387	21	3.25	"	"	1 1/4	1 to 1	1.45	475	19	7.60	"	"	3 1/2	4 to 1	3.75
390	30	5.98	1 1/4	5/8	1 1/4	1.7 to 1	2.00	470	76	30.24	3 1/4	1 1/4	3 1/2	4 1/2 to 1	12.50
389	18	3.60	"	"	1	1.7 to 1	1.50	469	17	6.76	"	"	3 1/2	4 1/2 to 1	3.30
398	60	14.33	2	3/4	2 1/2	1.50 to 1	4.50	412	48	20.01	3 1/2	1 1/4	2 1/2	1 1/2 to 1	9.55
397	40	9.56	"	"	1	1.50 to 1	2.75	411	42	18.38	"	"	2 1/2	1 1/2 to 1	8.80
424	21	5.01	1 1/2	3/4	1 1/4	1.6 to 1	1.90	474	55	24.07	"	"	2 1/2	1 1/2 to 1	11.35
423	13	3.10	"	"	1 1/4	1.6 to 1	1.60	473	44	19.26	"	"	1 1/2	1 1/2 to 1	9.20
422	30	8.12	2	"	3/2	1.7 to 1	2.60	410	109	47.71	"	"	6	6 to 1	22.00
421	20	4.47	"	"	1 1/2	1.7 to 1	1.95	409	18	7.88	"	"	3/4	6 to 1	4.10
42	42	10.03	"	"	1 1/2	2 to 1	2.80	466	85	37.20	"	"	4 1/4	7 to 1	17.25
41	21	5.01	"	"	1 1/2	2 to 1	2.00	465	12	5.25	"	"	1 1/2	7 to 1	2.95
450	45	10.74	1 3/4	"	1 3/4	3 to 1	2.75	478	40	19.10	4	1 1/2	2 1/4	1 1/2 to 1	10.40
449	15	3.58	"	"	1 3/4	3 to 1	1.75	477	30	14.32	"	"	2 1/4	1 1/2 to 1	7.95
400	48	12.00	2	"	2 1/2	3.00 to 1	4.00	414	52	24.82	"	"	2 1/2	1 1/2 to 1	13.35
399	16	4.00	"	"	2 1/2	3.00 to 1	2.00	413	39	18.60	"	"	1 1/2	1 1/2 to 1	10.15
444	56	13.37	2	"	2 1/2	4 to 1	4.00	488	36	17.19	4	1 1/2	1 1/2	1 1/2 to 1	9.40
443	14	3.34	"	"	2 1/2	4 to 1	1.75	487	22	10.50	"	"	1 1/2	1 1/2 to 1	6.00
464	45	14.32	2 1/2	1	1 1/2	1.2 to 1	5.25	446	64	30.56	"	"	3	2 to 1	16.25
463	38	12.10	"	"	1 1/2	1.2 to 1	4.60	445	32	15.28	"	"	1 1/2	2 to 1	8.40
468	67	21.33	"	"	1 1/2	1 1/2 to 1	7.40	452	45	21.49	"	"	2 1/2	3 to 1	11.65
467	50	15.92	"	"	1 1/2	1 1/2 to 1	5.75	451	15	7.16	"	"	3/4	3 to 1	4.25
489	31	9.87	2 1/4	"	1 1/2	1 1/2 to 1	3.90	4002	63	30.08	"	"	4 1/4	3 to 1	16.00
490	21	6.68	"	"	1 1/2	1 1/2 to 1	2.95	4001	21	10.03	"	"	1	3 to 1	5.75
448	38	12.10	2 1/2	"	1 1/4	1 1/2 to 1	4.60	498	75	35.81	"	"	5	3 to 1	19.00
447	25	7.96	"	"	1 1/4	1 1/2 to 1	3.35	497	25	11.94	"	"	3 1/2	3 to 1	6.75
428	57	18.14	"	"	1 1/4	1 1/2 to 1	6.40	462	60	28.65	"	"	3 1/2	3 1/2 to 1	15.30
427	38	12.10	"	"	1 1/4	1 1/2 to 1	4.60	461	16	7.64	"	"	1 1/2	3 1/2 to 1	4.50
456	32	10.19	"	"	1 1/4	2 to 1	4.00	4006	69	32.94	"	"	5 1/2	4.6 to 1	17.50
455	16	5.09	"	"	1 1/4	2 to 1	2.50	4005	15	7.16	"	"	1 1/2	4.6 to 1	4.25
442	48	15.28	"	"	2 1/4	2 to 1	5.55	480	92	43.93	"	"	6	7 to 1	33.25
441	24	7.64	"	"	2 1/4	2 to 1	3.25	479	13	6.21	"	"	3/4	7 to 1	3.75
454	60	19.10	"	"	2 1/2	2 to 1	6.75	39	50	28.12	5 1/2	1 1/4	1 1/2	1.43 to 1	19.00
453	30	9.55	"	"	2 1/2	2 to 1	3.80	40	35	19.75	"	"	1 1/4	1.43 to 1	14.00
394	40	12.75	2	1	2 1/2	2.67 to 1	5.00	432	54	30.10	4	"	4 1/4	1.8 to 1	20.00
393	15	4.81	"	"	2 1/2	2.67 to 1	2.40	431	30	16.75	"	"	1 1/4	1.8 to 1	12.00
402	55	17.51	2 1/2	"	2 1/2	2 1/2 to 1	6.25	440	60	33.48	"	"	4 1/4	3 to 1	24.00
401	20	6.37	"	"	2 1/2	2 1/2 to 1	2.85	439	20	11.20	"	"	1 1/4	3 to 1	7.60
430	48	15.28	"	"	2 1/2	3 to 1	5.55	0613B	24	12.37	5	"	2 1/4	1.33 to 1	10.00
429	16	5.09	"	"	2 1/2	3 to 1	2.50	613B	32	17.85	"	"	2 1/2	1.33 to 1	13.00
44	75	23.87	"	"	3	4 to 1	8.15	496	39	21.72	5	1 1/4	1 1/2	2 to 1	15.25
43	19	6.05	"	"	3	4 to 1	2.75	495	19	10.58	"	"	1 1/4	2 to 1	7.15
482	26	10.35	3	1 1/4	1 1/4	1.4 to 1	4.75	460	45	25.07	"	"	3 1/2	2 1/4 to 1	17.75
481	19	7.56	"	"	1 1/4	1.4 to 1	3.60	459	20	11.14	"	"	1	2 1/4 to 1	7.60
486	32	12.73	3 1/4	"	2	1 1/2 to 1	5.65	458	62	34.55	"	"	3 1/2	3.1 to 1	24.60
485	24	9.55	"	"	2	1 1/2 to 1	4.40	457	20	11.14	"	"	1	3.1 to 1	7.60
396	30	12.00	3	1 1/4	1	1.5 to 1	5.50	4008	66	42.02	7	2	2 1/4	3 to 1	38.00
395	20	8.00	"	"	1	1.5 to 1	3.80	4007	22	14.01	"	"	2 1/4	3 to 1	12.00
436	27	10.74	3	1 1/4	1 1/2	2 to 1	4.90	4010	72	45.85	6	"	7 1/4	5.53 to 1	45.00
435	13	5.17	"	"	1 1/2	2 to 1	2.65	4009	13	8.36	"	"	3/4	5.53 to 1	9.00
420	40	15.92	"	"	2 1/2	2 to 1	7.00	491	42	30.16	6 1/2	"	4 1/4	1.20 to 1	40.00
419	20	7.96	"	"	2 1/2	2 to 1	3.80	492	35	25.08	"	"	2 1/4	1.20 to 1	35.00
46	60	23.87	"	"	2 1/2	2 to 1	10.10	416	56	40.11	7	2 1/4	6 1/2	4 to 1	44.00
45	31	12.33	"	"	2 1/2	2 to 1	5.50	415	14	10.33	"	"	3/4	4 to 1	8.25
472	69	27.45	3 1/2	"	2 1/2	2 to 1	11.50	404	67	48.00	5	"	6 1/2	4 1/2 to 1	45.00
471	34	13.53	"	"	2 1/2	2 to 1	6.00	403	15	10.82	"	"	1	4 1/2 to 1	8.25
48	76	30.24	"	"	3	2 to 1	12.50	408	27	21.49	"	"	5	1.8 to 1	22.50
47	38	15.12	"	"	3	2 to 1	6.65	407	15	11.94	"	"	1 1/4	1.8 to 1	12.00
418	76	30.24	"	"	3	2 1/2 to 1	12.50	438	42	33.42	8	"	6 1/2	3 to 1	42.00
417	30	11.94	"	"	3	2 1/2 to 1	5.35	437	14	11.14	"	"	1	3 to 1	10.00
484	40	15.92	"	"	1 1/4	2 1/2 to 1	7.00	4004	48	42.02	7 1/2	2 1/4	5 1/2	1.8 to 1	70.00
483	15	5.97	"	"	1 1/4	2 1/2 to 1	3.00	4003	26	22.76	"	"	2 1/2	1.8 to 1	30.00
392	15	17.91	3	1 1/4	3 1/4	3 to 1	9.00	494	48	45.84	5	3	5 1/2	3.7 to 1	70.00
391	15	6.00	"	"	3 1/4	3 to 1	3.00	493	13	12.41	"	"	3/4	3.7 to 1	12.00
426	74	29.44	3 1/2	1 1/4	3	3 to 1	12.50	406	52	59.04	9	3 1/2	9	2 1/2 to 1	120.00
425	35	9.95	3 1/2	1 1/4	3 1/4	3 to 1	4.55	405	16	17.88	"	"	3 1/4	2 1/2 to 1	40.00
434	60	23.87	3	"	2 1/2	4 to 1	10.10								
433	15	5.97	3	"	2 1/2	4 to 1	3.00								

Other sizes, also Cut Gears quoted upon request



MITRE GEARING

A pair of mitre gears consists of two gears of the same diameter running at right angles to each other.

No. of Patt.	No. of Teeth	Diam.	Face	Pitch, in.	Back- ing	Price
601	18	4.20	1 1/4	1 1/4	1 1/4	\$ 1.80
602	42	10.03	1 1/4	1 1/4	1 1/4	2.80
612	20	8.36	2	1 1/4	1 1/4	2.80
602	19	6.66	2 1/4	1 1/4	1 1/4	2.30
61	25	7.96	2 1/4	1 1/4	1 1/4	2.60
67	37	11.78	2 1/4	1 1/4	1 1/4	3.60
64	44	14.01	2 1/4	1 1/4	1 1/4	4.25
62	30	10.74	2 1/4	1 1/4	1 1/4	3.50
608	55	19.70	2 1/4	1 1/4	1 1/4	8.00
609	25	9.95	3 1/4	1 1/4	1 1/4	4.25
63	36	14.32	3 1/4	1 1/4	1 1/4	6.00
614	29	15.52	3 1/4	1 1/4	1 1/4	6.00
65	40	15.92	3 1/4	1 1/4	1 1/4	6.00
605	48	19.10	3 1/4	1 1/4	1 1/4	8.00
69	66	26.26	3 1/4	1 1/4	1 1/4	11.00
68	85	33.82	3 1/4	1 1/4	1 1/4	14.00
604	42	20.46	4	1 1/4	1 1/4	10.40
66	55	26.26	4	1 1/4	1 1/4	15.00
613	24	13.37	5	1 1/4	2 1/2	8.50
615	29	18.46	6	2	2 1/2	15.00
606	38	24.19	6	2	2 1/2	19.00
610	50	31.83	6	2	2 1/2	28.00
607	54	42.97	7	2 1/2	3	40.00
611	25	23.87	8 1/2	3	4	38.00

SPUR RACKS AND PINIONS



Number of Teeth	Pitch	Face	Backing	Length	Price
61	1 1/2	1 1/4	3/4	30	\$ 2.10
38	1 1/2	1 1/4	1 1/4	23 1/2	2.30
32	1 1/2	1 1/4	1 1/4	21 1/2	1.65
32	1 1/2	1 1/4	1 1/4	21 1/2	2.45
37	1 1/2	1 1/4	1 1/4	22 1/2	3.37
38	1 1/2	1 1/4	1 1/4	33 1/2	2.70
37	1	2 1/4	1	37	3.43
16	1	1 1/4	1	16	1.50
24	1	2	1 1/4	23 1/2	3.60
26	1	2 1/4	1	26 1/2	4.80
30	1	2 1/4	1	30 1/2	3.37
48	1	2 1/4	1	48	6.67
31	1	2 1/4	1	30 1/2	4.65
46	1	3	1	46 1/2	7.10
21	1 1/4	2 1/4	1 1/4	23 1/2	3.75
35	1 1/4	3 1/4	1 1/4	29 1/2	9.25
24	1 1/4	2	1 1/4	30	3.37
23	1 1/4	2 1/4	1	28 1/2	3.96
25	1 1/4	2 1/4	1 1/4	31	7.35
29	1 1/4	2 1/4	1	36	5.85
29	1 1/4	2 1/4	1	36 1/2	5.45
25	1 1/4	2 1/4	1 1/4	31 1/2	6.75
20	1 1/4	2 1/4	1 1/4	30 1/2	7.35
24	1 1/4	4	1 1/4	31 1/2	3.96
18	1 1/4	2 1/4	1 1/4	21 1/2	6.30
20	1 1/4	3	1 1/4	30 1/2	8.85
20	1 1/4	3 1/2	1 1/4	30 1/2	8.85
48	1 1/2	4	1 1/4	72	19.25

For pinions to run on racks see plain spur gears. Any plain spur gear will mesh with a rack of corresponding pitch.

In ordering spur racks state the number of teeth, pitch and face, also number of lugs on a side as well as the backing, if desired otherwise than shown in the catalogue.

WORMS AND WORM GEARS



No. of Pattern	No. of Teeth	Diameter	Face	Pitch, inches	Price	Additional Price for Housings	Remarks
307	28	5.57	1	1 1/4	\$ 2.75		Right
308	Worm	2 1/4	—	—	2.60		
317	24	5.73	1 1/4	1 1/4	3.00		Right
318	Worm	2.50	—	—	2.85		
319	24	5.73	1 1/4	1 1/4	3.00		Left
320	Worm	2.50	—	—	2.85		
30	24	6.67	1 1/4	1 1/4	3.30		Right
32	Worm	3.00	—	—	3.30		
31	36	10.03	1 1/4	1 1/4	3.50		Right
32	Worm	3.00	—	—	3.50	\$70.00	
305	36	10.03	1 1/4	1 1/4	3.50		Left
306	Worm	3.00	—	—	3.50	70.00	
33	62	19.74	2	1	8.90		Right
34	Worm	4.50	—	—	5.50		
311	20	9.60	2 1/4	1 1/2	6.20		Right
312	Worm	4.50	—	—	6.00		
301	30	14.35	3 1/4	1 1/2	11.75	90.00	Right
302	Worm	6.00	—	—	10.46		
315	30	14.35	3 1/4	1 1/2	11.75	90.00	Left
316	Worm	6.00	—	—	10.46		
303	30	14.35	3 1/4	1 1/2	14.00	90.00	Dbl. Thr'd Worm
304	Worm	6.00	—	—	13.40		
35	50	27.87	4	1 1/4	27.05	140.00	Right
36	Worm	7.50	—	—	13.20		
309	50	27.87	4	1 1/4	30.00	140.00	Dbl. Thr'd Worm
310	Worm	7.50	—	—	14.50		
37	60	38.21	5	2	41.80	240.00	Right
38	Worm	9.00	—	—	17.50		
313	48	38.21	5	2 1/2	45.00	240.00	Dbl. Thr'd Worm
314	Worm	9.00	—	—	19.50		

HORSE-POWER OF GEARING

At a periphery speed of 100 feet per minute on pitch line

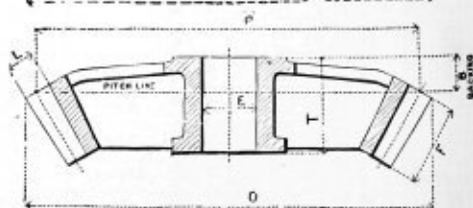
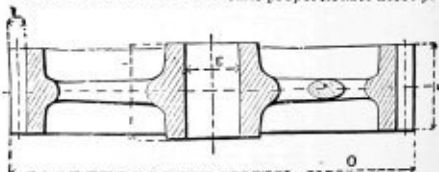
Spur Gearing

Pitch.....	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3
Face.....	2 1/2	3	4	5	6	7	7 1/2	9
H. P.	1.6	2.33	3.7	5.5	7.4	10.4	11.6	16.3

Mitre and Bevel Gearing

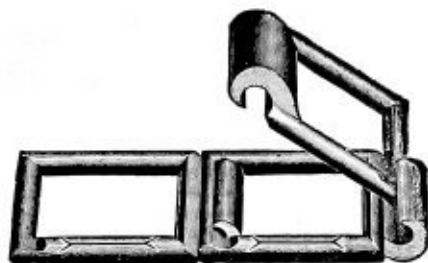
Pitch.....	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3
Face.....	2 1/2	3	4	5	6 1/2	7	7 1/2	9
H. P.	1.5	2	2.3	4.8	6.4	8	9.6	15.7

Gears of different face transmit proportionate horse-power.



On all orders for gears to replace old or broken gears give number of teeth, also dimension indicated by letters in above diagrams.

DETACHABLE LINK BELTING



Price List, Standard Sizes, January, 1909

No.	Plain Chain, per foot	Couplers, per pair	Approximate No. of Links in 10 feet	Average Ultimate Strength	No.	Plain Chain, per foot	Couplers, per pair	Approximate No. of Links in 10 feet	Average Ultimate Strength
25	\$0.11	\$0.11	133	700	75	\$0.24	\$0.19	46	4,000
32	.11	.14	104	1,100	77	.25	.22	52	3,600
33	.11	.13	86	1,190	78	.34	.25	46	4,900
34	.11	.13	86	1,300	83	.35	.32	30	4,950
35	.11	.16	74	1,200	85	.44	.44	30	7,600
42	.12	.16	88	1,500	88	.43	.28	46	5,750
45	.11	.16	74	1,600	93	.49	.44	30	7,500
51	.17	.16	104	1,900	95	.53	.54	30	8,700
52	.18	.16	80	2,300	103	.67	.58	39	9,600
55	.16	.16	74	2,200	108	.63	.79	25½	9,900
57	.18	.19	52	2,800	110	.74	.92	25½	12,700
62	.22	.22	73	3,100	114	.85	.84	37	11,000
66	.23	.22	60	2,600	122	1.13	1.58	20	15,000
67	.23	.22	52	3,300	124	1.03	1.19	30	12,700

Proper Working Load and Horse Power of Link Belting:—

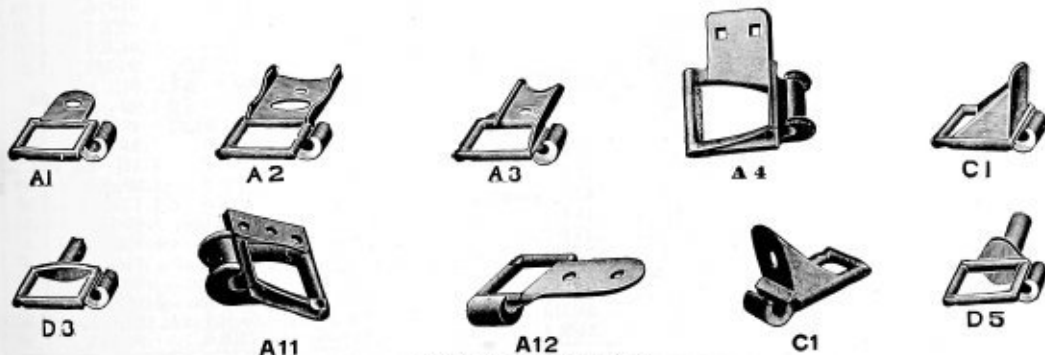
	To Obtain Proper Working Load.						
Divide the "Ultimate Strength" by...	Speed.....	200	300	400	500	600	700
Figures Given on this Line.....	Divided by....	6	8	10	12	16	20
The speeds given are in feet per minute.							

The speeds given are in feet per minute.

If the load to be transmitted is irregular, or subject to shock, a still further reduction of the working load must be made.

To obtain **Horse Power**:—Multiply the working load, ascertained as above, by the number of feet the chain travels per minute, and divide the result by 33,000.

STANDARD LINK BELT ATTACHMENTS



Continued on next page.

STANDARD LINK BELT ATTACHMENTS (Continued from previous page)



E1



F2



F4



FF



G6



G19



H1



H2



KI



K2



K3



K5



K6



M3



45 Coupling Link



R1



R3



S1



S2

PRICE LIST STANDARD ATTACHMENTS (Per foot)

No. 25	No. 33	No. 45	No. 52	No. 62	No. 77	No. 78	No. 88	No. 108
A1...\$0.21	H2...\$0.26	A2...\$0.25	E1...\$0.33	A12...\$0.39	A1...\$0.37	R3...\$0.50	G19...\$0.81	F2...\$1.18
A3...\$0.23	K1...\$0.25	A3...\$0.28	F2...\$0.43	C1...\$0.39	A12...\$0.55	S2...\$0.52	H1...\$0.76	FF...\$1.12
C1...\$0.29	K3...\$0.39	A12...\$0.25	G1...\$0.32	C5...\$0.58	D5...\$0.42	No. 83	H2...\$0.78	G1...\$0.97
C5...\$0.51	K5...\$0.25	C1...\$0.27	K1...\$0.35	D5...\$0.45	E1...\$0.38	A1...\$0.81	K1...\$0.61	K2...\$1.02
D3...\$0.26	K6...\$0.35	D1...\$0.58	K5...\$0.32	G1...\$0.46	F2...\$0.64	D5...\$0.67	K5...\$0.91	No. 110
E1...\$0.21	M1...\$0.29	D3...\$0.34	No. 55	K1...\$0.35	G1...\$0.48	E1...\$0.57	R1...\$0.51	F2...\$1.27
G1...\$0.28	S1...\$0.25	D5...\$0.32	A1...\$0.25	K5...\$0.33	G6...\$0.51	FF...\$0.88	S2...\$0.62	K2...\$1.12
H2...\$0.28	No. 34	E1...\$0.21	A2...\$0.32	S1...\$0.32	G19...\$0.51	G1...\$0.74	No. 93	No. 114
K1...\$0.26	A1...\$0.21	F2...\$0.27	A3...\$0.32	No. 66	H1...\$0.48	M3...\$0.75	G1...\$0.90	A11...\$1.06
K5...\$0.23	C1...\$0.33	G1...\$0.23	C1...\$0.31	C1...\$0.40	H2...\$0.51	No. 85	No. 95	C1...\$1.22
K6...\$0.29	E1...\$0.24	H2...\$0.35	C5...\$0.43	K1...\$0.48	R1...\$0.32	F2...\$0.92	H1...\$0.86	D5...\$1.46
M1...\$0.27	K1...\$0.29	K1...\$0.26	E1...\$0.25	No. 67	R3...\$0.36	F8...\$1.06	K2...\$0.84	DD...\$1.55
S1...\$0.27	No. 35	K3...\$0.34	F2...\$0.35	A1...\$0.32	S2...\$0.39	FF...\$0.81	No. 103	F8...\$1.33
A1...\$0.24	A2...\$0.32	K5...\$0.25	K1...\$0.28	A1...\$0.37	No. 78	G6...\$0.71	A1...\$0.91	G6...\$1.66
A2...\$0.25	C1...\$0.32	K6...\$0.36	K5...\$0.30	A7...\$0.37	A3...\$0.59	H1...\$0.72	A3...\$1.02	K1...\$1.21
A3...\$0.25	E1...\$0.25	M1...\$0.25	M1...\$0.28	A11...\$0.34	A7...\$0.55	K2...\$0.72	A4...\$0.94	K2...\$1.27
C1...\$0.32	K1...\$0.32	S1...\$0.23	S1...\$0.25	D5...\$0.43	A11...\$0.50	M3...\$0.78	A5...\$0.99	M3...\$1.25
C5...\$0.38	K5...\$0.30	No. 51	No. 57	F2...\$0.48	D5...\$0.65	S2...\$0.64	A11...\$0.91	No. 122
D3...\$0.27	S1...\$0.25	C1...\$0.34	A3...\$0.33	FF...\$0.49	E1...\$0.47	No. 88	D5...\$1.02	F2...\$1.58
E1...\$0.21	No. 42	D4...\$0.69	A7...\$0.30	G1...\$0.50	F2...\$0.70	A1...\$0.70	DD...\$1.40	K2...\$1.66
G1...\$0.25	A1...\$0.21	D5...\$0.43	C1...\$0.30	H1...\$0.50	F4...\$0.71	A3...\$0.70	E1...\$0.94	No. 124
K1...\$0.30	A3...\$0.32	K1...\$0.32	D5...\$0.37	K1...\$0.40	FF...\$0.73	A7...\$0.63	F2...\$1.11	A4...\$1.40
K3...\$0.39	C1...\$0.29	K5...\$0.32	E1...\$0.27	S2...\$0.35	G1...\$0.59	A11...\$0.60	F8...\$1.26	A4...\$1.47
K5...\$0.23	E1...\$0.20	M1...\$0.42	F2...\$0.43	No. 75	G6...\$0.68	C1...\$0.77	G6...\$1.13	A11...\$1.45
K6...\$0.38	K1...\$0.26	S1...\$0.28	H2...\$0.44	E1...\$0.36	G19...\$0.66	D5...\$0.77	G19...\$1.09	F2...\$1.54
M1...\$0.32	K3...\$0.37	No. 52	K1...\$0.35	F2...\$0.52	H1...\$0.66	E1...\$0.64	H2...\$1.02	F8...\$1.84
S1...\$0.26	K6...\$0.24	A1...\$0.28	S2...\$0.32	H1...\$0.45	H2...\$0.45	F2...\$0.80	K1...\$0.95	G1...\$1.47
No. 33	K6...\$0.37	A3...\$0.34	No. 62	H2...\$0.45	K1...\$0.47	F8...\$0.89	K2...\$0.99	G6...\$1.58
A1...\$0.17	S1...\$0.25	C1...\$0.33	A1...\$0.32	K1...\$0.39	K3...\$0.66	FF...\$0.75	M3...\$1.16	G19...\$1.44
D3...\$0.39	No. 45	D4...\$0.63	A2...\$0.34	M3...\$0.65	M3...\$0.70	G1...\$0.66	R1...\$0.82	K1...\$1.56
E1...\$0.18	A1...\$0.20	D5...\$0.45	A3...\$0.34	R1...\$0.29	R1...\$0.42	G6...\$0.73	R3...\$0.90	M3...\$1.59

Price on Special Attachments Quoted upon Request.

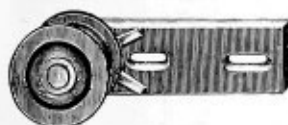
TRACTION WHEELS FOR LINK BELTING

With Smooth Rims for Use in Elevators Handling Heavy or Gritty Materials

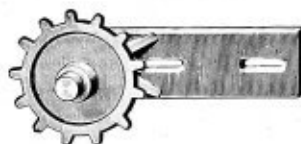


Nos. 85, 95 BORE, 2 1/4 INCHES AND LESS		Nos. 108, 110 BORE, 3 1/8 INCHES AND LESS		No. 122 BORE, 3 1/2 INCHES AND LESS	
Pitch Diameter, inches	Price	Pitch, Diameter, inches	Price	Pitch, Diameter, inches	Price
12	\$ 7.55	16 1/2	\$11.85	12	\$11.55
13	8.10	17	12.10	16	13.60
14	8.65	17 1/4	12.25	17 1/4	14.15
15	9.10	18	12.65	18	14.60
15 1/2	9.65	18 1/2	13.05	19 1/4	15.25
16 1/2	10.20	20	14.05	20	15.80
17 1/2	10.60	22	15.70	21 3/4	16.80
17 3/4	10.90	22 1/2	16.25	22	17.05
18	11.00	24	17.20	23 3/4	17.90
19	11.55	24 1/2	17.75	24	18.15
20	12.10	28	21.05	25 1/4	19.00
20 1/2	12.50	30	23.25	26	19.55
24	14.60	36	28.20	29 1/4	22.55
25	15.25	36 3/4	28.75	30	23.10
28	18.70			31	23.95
30	20.90			36 1/2	27.65
30 1/2	22.00			37	28.05
35 1/2	26.95			42	33.40
36	27.50				
No. 103 BORE, 3 1/2 INCHES AND LESS		No. 124 BORE, 3 1/2 INCHES AND LESS		No. 114 BORE, 3 1/8 INCHES AND LESS	
Pitch, Diameter, inches	Price	Pitch, Diameter, inches	Price	Pitch, Diameter, inches	Price
18 1/2	\$10.85	16 1/2	\$12.50	16 1/2	\$10.85
20	12.50	18 1/4	14.75	18	12.50
20	21.80	20	16.00	24	18.10
		21 1/2	17.50		
		24	19.75		
		31	26.00		

IDLERS AND TIGHTENERS FOR LINK BELTING



Roller Idler



Sprocket Tightener A



Sprocket Tightener B

For Link Belt	No. 52 and Smaller	Nos. 57 to 77	Nos. 78 to 103
Roller Idler	\$5.00	\$7.50	\$10.00
Tightener Style A	5.00	7.50	10.00
" " B	5.00	8.00	12.00

BULLOCK PLAIN BACK SHOVELS



We manufacture all of our shovels, scoops, spades, etc., and aim to make only a superior quality of these tools. The different grades are designated by our trade brands and each grade will be found exactly as represented.

Bullock Plain Back Shovels are made of the best Crucible Steel, finely finished, with best white ash handles; they will outlast any other make. Railroad contractors and any one who needs a strong shovel for the hardest service will appreciate the quality put into this implement.

Our location, equipment and facilities enable us to keep our cost of production at the minimum and our prices will always be found right.

(SEE INDEX.)

INTERLOCKING RIVETED PINTLE CHAIN BELT



Will run on standard sprocket wheels, as indicated, but for full limit of service heavier wheels are generally used.

To figure Working Loads from Ultimate Strengths given in table, take from one-sixth to one-twentieth according to speed and diameter of sprockets and nature of work.

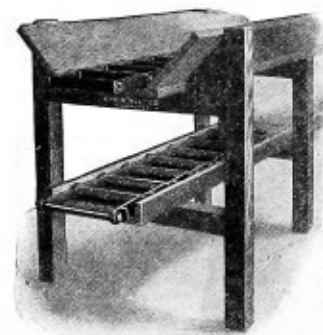
FEATURES

1. Interlocking Dirt Proof Joints
2. Reamed Bearings.
3. Smooth Steel Rivets.
4. Judicious Distribution of Metal.
5. Oil Holes.
6. Head Locks for Rivets.

Number	Ultimate Strength in Pounds	Will Work on Standard Sp. Wh. of Link Belt No.	Approximate Links in Ten Feet	Plain Links, Per Foot
152	4900	62	80	\$0.38
6314	8400	62	73	.51
6318	9400	67-77	62	.36
6319	9600	75-78-88	46	.36
6321	12000	75-78-88	46	.46
6326	14000	75-78-88	46	.50
6326	18000	103	39	.64
6326	14000	85-95	30	.50
6328	18000	85-95	30	.57
6339	20000	108	25½	.87
6340	30000	124	20	.96

INTERLOCKING CONVEYOR CHAIN BELT

This chain is formed of links cast in one piece and provided with large lubricant chambers containing graphite grease in sufficient quantity to last about six months.



No.	Description	Pitch in.	WIDTH		HEIGHT		Working Strain in lbs.	List Price Per Foot
			Inside, in.	Over All, in.	Side Bar, in.	Over All, in.		
410	Shoe Link.....	6	25½	6	1½	1½	5000	\$9.80
415	Shoe Link.....	6	29½	9	1½	1½	5000	.84
425	Wing.....	6	25½	6½	1½	1½	4000	.70
430	Wing.....	6	25½	9½	1½	1½	4000	.75
450	Plain.....	6	4½	8	1½	1½	6000	1.04
450	Spur R. & L.....	6	4½	8	1½	4	6000	1.18
450	C-½.....	6	4½	8	1½	2½	6000	1.14
450	C-1.....	6	4½	8	1½	4	6000	1.42
450	C-2.....	6	4½	11½	1½	4	6000	1.47
450	C-1 and 2.....	6	4½	11½	1½	4	6000	1.48
452	Wing.....	6	4½	11½	1½	1½	6000	1.13
452	Wing & Spur R. & L.....	6	4½	11½	1½	4	6000	1.32
455	Plain.....	6	6½	9½	1½	1½	6000	1.24
460	Plain.....	6	8½	12	1½	1½	6000	1.31
460	C-½.....	6	8½	12	1½	2	6000	1.35
460	C-¾.....	6	8½	12	1½	2½	6000	1.55
460	Spur R. & L.....	6	8½	12	1½	4	6000	1.24
461	Plain.....	6	9½	12½	1½	1½	6000	1.35
461	C-¾.....	6	9½	12½	1½	2½	6000	2.00
465	Wing.....	6	8½	13½	1½	1½	6000	1.35
465	Spur 1.....	6	8½	13½	1½	4	6000	1.50
465	Spur 2.....	6	8½	13½	1½	4	6000	1.55
465	C-1.....	6	8½	13½	1½	3½	6000	1.65
467	Wing.....	6	8½	17½	1½	1½	6000	1.65
480	Plain.....	8	11½	16	2	2	10000	1.84
480	C-½.....	8	11½	16	2	2½	10000	1.89
480	C-1.....	8	11½	16	2	4	10000	2.25
480	Spur.....	8	11½	16	2	4½	10000	2.40
480	Double Spur.....	8	11½	16	2	4½	10000	2.60
481	Plain.....	8	12½	16	2	2	10000	1.90
483	Plain.....	8	10½	13½	2	2	10000	1.80
485	Wing.....	8	11½	19½	2	2	10000	2.50

No. 1050 MAMMOTH CHAIN BELT

For Log Haul, Ice Elevators and Heavy Conveying and Transmitting



Detachable at every link. Large wearing joints. The sections are held securely together by strong bolts riveted over the nuts. The nuts can be turned off with wrench and the chain disconnected without any slack. Can be coupled together tight around the sprocket wheels without slack.

Price per foot.....\$1.90

H.Channon Company. Chicago.

COIL CHAIN FOR CONVEYORS AND ELEVATORS

This Chain is Accurately Pitched and will work on Sprocket Wheels

For Handling Logs, Lumber, Refuse, Etc.



Number.....	530	531	532	533	534	535	536	538
Length of Link, inside, inches.....	4	5	6	7	7	8	8	8
Size Iron in Link, ".....	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Weight, per 100 foot, lbs.....	190	300	400	520	745	1015	1665	2170
Price, per foot.....	\$0.29	.27	.35	.46	.60	.83	1.00	1.47

In ordering Chain, not listed, give inside width and length of Link and Diameter of Iron.

STANDARD ATTACHMENTS FOR COIL CONVEYOR CHAINS



F2



FF



F5



K2

Also used as E1



T



T2



K



Coupling Link



S1-Log Tooth



Sprocket Wheel

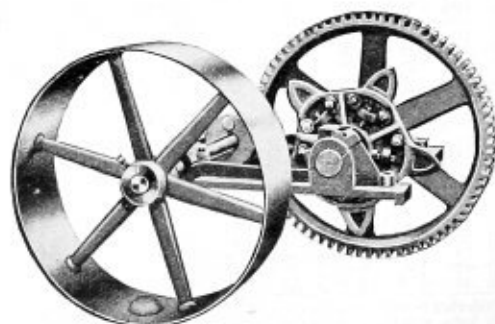


Idler



Drum Wheel

INDEPENDENT IRON FRAME LOG JACKS

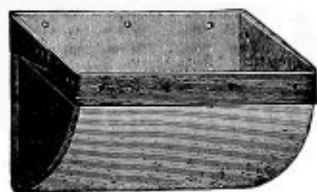


No. 1 for light logs and slabs, requiring Cable Chain $\frac{3}{8}$ " to $\frac{1}{2}$ ", or chains of similar strength. Made up with Main Shaft, $2\frac{1}{2}$ ", Counter Shaft $2\frac{1}{8}$ ", Spur Gear, $48 \times 4\frac{1}{2}$ "; Shrouded Pinion, $7\frac{1}{4} \times 5\frac{1}{2}$ "; Double Belt Pulley, 48×8 "; complete with Cast Iron Base, Babbitted Bearings and Adjustable Steel Tooth Sprocket Wheel. \$100.00.

No. 2 for medium work, requiring Chains $\frac{1}{2}$ " to $1\frac{1}{2}$ " in size, No. 119, or of equal strength. Made up with Main Shaft, $3\frac{1}{2}$ "; Counter Shaft, $2\frac{1}{2}$ "; Spur Gear, $41\frac{1}{2} \times 6$ "; Shrouded Pinion, $8\frac{1}{2} \times 6\frac{1}{2}$ "; Double Belt Pulley, 40×12 "; all complete with Cast Iron Base, Babbitted Bearings and Adjustable Steel Tooth Sprocket Wheel. \$136.00.

No. 3 for heavy work, for Chains $1\frac{1}{2}$ " to $1\frac{3}{4}$ ", or of equal strength. Made up with Main Shaft, $4\frac{1}{2}$ "; Counter Shaft $3\frac{1}{2}$ "; Spur Gear, 48×8 "; Shrouded Pinion, $10\frac{1}{2} \times 8\frac{1}{2}$ "; Double Belt Pulley, 48×10 " complete with heavy Cast Iron Base, Babbitted Bearings and Adjustable Steel Tooth Sprocket Wheel. \$254.00.

STERLING RIVETED ELEVATOR BUCKETS



The smaller sizes are made of tin and the larger of smooth refined steel. The ends are double seamed to the body and guarded with band iron firmly riveted, making the bucket light and firm. The shape is adapted to a quick and easy discharge of contents.

TIN MILL BUCKETS

Width on Belt, inches	Projection, inches	Price Each	Width on Belt, inches	Projection, inches	Price Each
2	2	\$0.06	4	3½	\$0.12
2½	2½	.07	4½	3½	.13
3	3	.08	5	4	.15
3½	3	.09	5½	4	.16
4	3	.11	6	4	.17

STEEL GRAIN BUCKETS

Width on Belt, inches	Projection, inches	Price Each	Width on Belt, inches	Projection, inches	Price Each
5	4	\$0.15	11	6	\$0.33
5½	4	.16	12	6	.36
6	4	.17	14	6	.42
7	4½	.21	For larger sizes see "Warehouse" Buckets		
8	5	.25			
9	5	.27			
10	5½	.30			

HEAVY STEEL EAR CORN BUCKETS

Similar to the Steel Grain Buckets but made of much heavier materials.

Across Belt, inches	Projection, inches	No. of Bolt Holes	Capacity, Quarts	Price Each
7	5	3	1½	\$0.27
8	5½	3	2	.30
9	6	3	2½	.33
10	6	3	3	.36
11	7	4	3½	.44
12	7	4	4	.48
13	7	4	4½	.52
14	7	4	5	.54

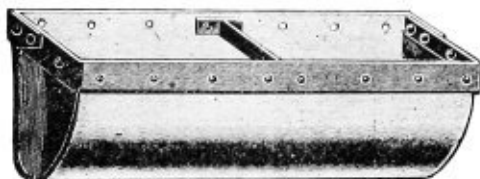
For larger sizes see "Warehouse" Buckets

GALVANIZED STEEL BUCKETS

For Malt Houses, Breweries, Distilleries, etc. These buckets are galvanized after being made.

Width on Belt, inches	Projection, inches	Price Each
6	4	\$0.25
7	4½	.30
8	5	.35
9	5	.40
10	5½	.45
11	6	.48
12	6	.52
14	6	.56

STERLING WAREHOUSE BUCKETS



Concave Back—rounded bottom

Made of cold rolled steel and reinforced with 1½ inch No. 12 steel bands.

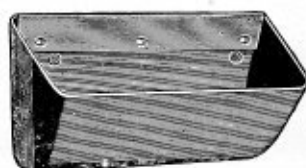
Width on Belts, inches	Projection, inches	Depth, inches	No. 24 Steel, with Malleable "I" Brace	No. 24 Steel, with "Z" Brace
16	6	6	\$0.66	\$0.62
18	6	6	.78	.74
20	6	6	.86	.80
12	7	7	.60	.....
14	7	7	.68	.....
16	7	7	.80	.76
18	7	7	.88	.84
20	7	7	.94	.90
12	7	7½	.64	.....
14	7	7½	.72	.....
16	7	7½	.86	.82
18	7	7½	.94	.90
20	7	7½	1.00	.96
14	7½	7½	.78	.....
16	7½	7½	.92	.88
18	7½	7½	1.00	.96
20	7½	7½	1.10	1.06
14	7½	8	.82	.....
16	7½	8	.96	.92
18	7½	8	1.04	1.00
20	7½	8	1.16	1.12
14	8	8	.88	.....
16	8	8	1.04	1.00
18	8	8	1.12	1.08
20	8	8	1.20	1.16

Table Showing Carrying Capacity of the Steel Grain Bucket

Size	12 inches apart, Speed 200 feet per minute, No. Bushels per Hour.	12 inches apart, Speed 300 feet per minute, No. Bushels per Hour.	12 inches apart, Speed 400 feet per minute, No. Bushels per Hour.
5x4	250	371	625
6x4	275	412	687
7x4½	500	637	1062
8x5	600	900	1500
9x5	650	1012	1687
10x5½	850	1275	2125
11x6	1105	1725	2875
12x6	1300	1950	3250
14x6	1600	2400	4000
20x6	2275	3412	5687

H.Channon Company. Chicago.

STANDARD "SALEM" STEEL ELEVATOR BUCKETS



Made from one sheet of steel, with round corners and bottom. The side pieces are bent around the back and riveted as shown. The seams at the lower corners are bent under and hammered tight.

	SIZE OF BUCKET		Capacity, Bushels per hour, at speed 300 ft. per minute, buckets 12 inches apart	SUITABLE FOR ORDINARY MILL AND ELEVATOR WORK		SUITABLE FOR EAR CORN AND SIMILAR HEAVY SUBSTANCES	
	Width on Belt	Projection		Gauge of Steel No.	Price, Each	Gauge of Steel No.	Price Each
6	2	2	21	25	\$0.04	18	\$0.16
8	2 1/2	2 1/2	40	24	.06	18	.18
	3	2 1/2	59	24	.06	18	.19
10	3 1/2	3 1/2	69	24	.07	18	.20
	3	3	87	23	.09	16	.28
	3 1/2	3	102	23	.10	16	.29
12	4	3	116	23	.11	16	.30
	4 1/2	3	131	23	.12	16	.31
	4	3 1/2	159	22	.12	16	.33
14	4 1/2	3 1/2	179	22	.13	16	.34
	5	4	199	22	.14	16	.36
	5 1/2	4	229	22	.18	16	.39
16	6	4 1/2	251	21	.19	16	.40
	6	4	274	21	.20	16	.41
18	7	4 1/2	500	20	.30	16	.49
	8	5	670	19	.41	16	.59
19	9	5	754	19	.43	16	.63
	10	5 1/2	973	19	.54	16	.76
20	10	6	1220	18	.62	16	.81
	11	6	1342	18	.65	16	.85
21	12	6	1461	18	.68	16	.89
	14	6	1708	18	.74	16	.97
22	16	6	1963	18	.81	16	1.06
	18	6	2196	18	.89	16	1.13
23	20	6	2440	18	.96	16	1.21
	10	7	1590	18	.73	16	1.01
24	11	7	1749	18	.76	16	1.06
	12	7	1908	18	.80	16	1.09
	14	7	2226	18	.88	16	1.17
25	16	7	2544	18	.96	16	1.25
	18	7	2902	18	1.04	16	1.33
	20	7	3180	18	1.12	16	1.41

Gauges.

HEAVY "SALEM" STEEL ELEVATOR BUCKETS

SIZE OF BUCKET		SUITABLE FOR ORES, COAL, BROKEN STONE AND EXTRA HEAVY SUBSTANCES				
Width	Projection	Gauge No. 14 Price, Each	Gauge No. 12 Price, Each	Gauge No. 10 Price, Each	Gauge No. 8 Price, Each	Gauge No. 6 Price, Each
4	3 1/2 inches	\$0.35				
4 1/2	3 1/2	.36				
5	3 1/2	.37				
5 1/2	4	.44				
6	4	.45				
7	4 1/2	.46				
8	5	.54				
9	5	.66				
10	5 1/2	.70				
11	6	.88				
12	6	.90				
14	6	.94				
16	6	.98				
18	6	1.06				
20	6	1.15				
22	6	1.25				
24	6	1.35				
26	7	1.10				
28	7	1.15				
30	7	1.20				
32	7	1.30				
34	7	1.40				
36	7	1.50				
38	7	1.62				
40	7					
42	7					
44	7					
46	7					
48	7					
50	7					
52	7					
54	7					
56	7					
58	7					
60	7					
62	7					
64	7					
66	7					
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84	7					
86	7					
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MALLEABLE IRON ELEVATOR BUCKETS



Style "A"
For cement, coal, chemicals,
pulp, etc.



Style "B"
For ores, stones, etc., in
inclined elevators



Style "C"
For sugar, clay and
sticky materials

These buckets are cast in one piece and carefully annealed, they are seamless, strong and smooth and their rounded corners guarantee free delivery of the material handled. Punched as directed at no extra charge.

STYLE "A"

Length, inches	Width or Projection	Depth, inches	Cap. Cu. inches	Cap. Quarts	Price
4	2 3/4	3	16	.27	\$0.21
5	3 1/2	3 3/4	36	.62	.34
6	4	4 1/4	55	.95	.48
7	4 1/2	5	85	1.47	.62
8	5	5 1/2	115	1.99	.78
10	6	6 1/4	204	3.53	1.20
11	6	6 3/4	223	3.86	1.30
12	6	6 1/2	246	4.25	1.40
12	7	7 1/4	332	5.74	1.85
14	7	7 1/4	391	6.77	2.10
15	7	7 1/4	425	7.35	2.20
16	7	7 1/4	467	8.08	2.30
14	8	8 1/2	509	8.81	2.75
16	8	8 1/2	593	10.26	3.10
18	8	8 1/2	668	11.56	3.50
18	10	10 1/2	1053	18.23	4.75

STYLE "B"

Length, inches	Width or Projection	Depth, inches	Cap. Cu. inches	Cap. Quarts	Price
4	1 1/2	2 1/4	6	.10	\$0.12
7	3 1/2	5	55	.95	.48
8	3 1/2	5	65	1.12	.50
10	4	5 1/2	107	1.85	.90
12	5 1/2	7 1/2	233	4.03	1.44
16	6 1/2	9	412	7.13	2.30

STYLE "C"

Length, inches	Width or Projection	Depth, inches	Cap. Cu. inches	Cap. Quarts	Price
8	4 1/2	4	50	1.	\$0.63
10	5	4	80	1.5	.95
12	5	4	100	2.	1.05
16	7	5 1/2	250	6.5	2.20

New list adopted by all Bucket Manufacturers.

HEAVY STEEL ELEVATOR BUCKETS

For Broken Stone, Ore, Coal, Sand, Gravel, etc. Price List below covers Style "A" buckets only. Prices on Style "B" and special sizes and shapes quoted upon request.



Style "A"



Style "B"

SIZE OF BUCKET			No. 18 Gauge	No. 16 Gauge	No. 14 Gauge	No. 12 Gauge	No. 10 Gauge	No. 8 Gauge
Width Across Belt in inches	Projection from Belt in inches	Length on Belt in inches						
5	x	3	\$0.36	\$0.42	\$0.50	\$0.60		
6	x	3 1/2	.45	.54	.65	.85		
7	x	4	.50	.60	.75	.95		
8	x	4 1/2	.60	.75	.90	1.15		
9	x	5		.85	1.05	1.35	\$1.45	
10	x	5 1/2		.90	1.15	1.35	1.55	
11	x	6		1.00	1.25	1.55	1.75	\$2.05
12	x	6 1/2		1.10	1.35	1.65	1.95	2.35
13	x	7		1.30	1.65	1.95	2.25	2.65
14	x	7 1/2			1.85	2.25	2.65	3.15
15	x	8			1.95	2.45	2.85	3.45
16	x	8 1/2			2.00	2.45	2.85	3.45
17	x	9			2.10	2.55	2.95	3.55
18	x	9 1/2			2.30	2.85	3.25	3.85
20	x	9			2.40	2.95	3.35	3.95
22	x	10			2.60	3.15	3.55	4.15
24	x	10			3.00	3.45	3.85	4.45
30	x	10			3.60	4.35	4.85	5.45



For List Prices, etc., of Elevator Bolts, see index.

STANDARD CAST-IRON ELEVATOR BOOTS

For Wood Legging

It is furnished with self-locking shields, tightener screws, pulley, shaft and oil tubes. Gates are provided in both ends and hand holes on the sides, which facilitate the rapid clearing out of the Boot in case of a choke-down.

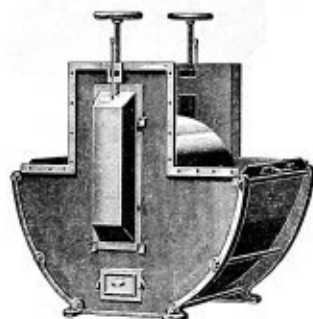


Fig. 86

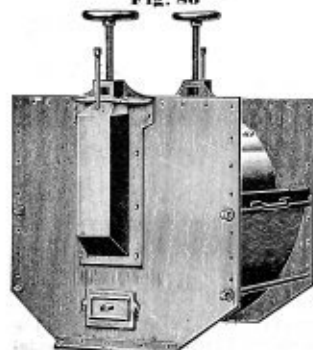


Fig. 91

PRICE LIST

No. of Boot	Size of Bucket, inches	Size of Pulley, inches	Price	No. of Boot	Size of Bucket, inches	Size of Pulley, inches	Price
8	4½ x 3½	10 x 5½	\$21.00	3	11 x 7	20 x 13	\$56.00
7	5 x 4	12 x 6	24.00	3	12 x 7	20 x 14	58.00
7	6 x 4	12 x 7	25.00	3	13 x 7	20 x 15	60.00
6	7 x 4½	14 x 9	28.00	3	14 x 7	20 x 16	62.00
5	8 x 5	16 x 10	34.00	3	15 x 7	20 x 17	64.00
5	9 x 5	16 x 10	36.00	2	18 x 6	22 x 20	68.00
5	10 x 5½	16 x 11	38.00	2	20 x 6	22 x 22	70.00
4	11 x 6	18 x 13	44.00	2	16 x 7	22 x 18	66.00
4	12 x 6	18 x 14	46.00	2	18 x 7	22 x 20	68.00
4	14 x 6	18 x 16	48.00	2	20 x 7	22 x 22	70.00
4	16 x 6	18 x 18	50.00				

STANDARD WROUGHT STEEL ELEVATOR BOOTS

For Light or Medium Service

Furnished with tightener screws, pulley, shaft and oil tubes. One end is made to lift out for cleaning purposes. When so specified, both ends will be made in this manner, and hand holes in the sides can also be provided. A small additional charge is made for such modifications.

PRICE LIST

Size of Bucket, inches	Size of Pulley, inches	Price	Size of Bucket, inches	Size of Pulley, inches	Price
5 x 4	10 x 6	\$18.00	9 x 5	16 x 11	\$27.50
6 x 4	12 x 7	20.00	10 x 5 ½	16 x 12	30.00
7 x 4½	14 x 9	22.00	11 x 6	18 x 13	32.50
8 x 5	14 x 10	23.00	12 x 6	18 x 14	35.00

ELEVATOR BOOTS AND HEAD TAKE-UPS

Used in Cement Plants and for Ashes, Sand, Ores and Other Abrasive Materials

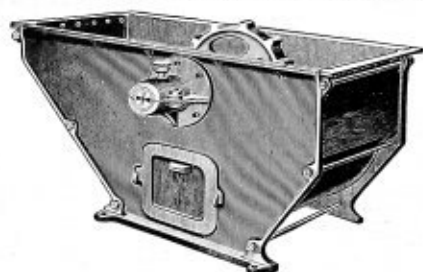


Fig. 88—Solid Bearing Cast-Iron Boot

Boots of above design are used whenever it is necessary to drive the elevator from the bottom, the Fig. 96 Take-Ups being placed at the head.

The receiving end is longer than the back, which has a tendency to prevent jamming or breaking of the material handled.

Prices quoted upon request.

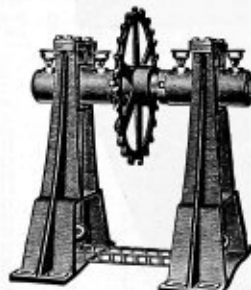


Fig. 96—Head Take-Ups

Also furnished with pulleys or traction wheels instead of sprockets, for taking up slack of bucket elevators at the head instead of the foot.

Diam. of shaft ... 2 ⅞ in. 2 ⅞ in. 2 ⅞ in. 3 ⅞ in.
Length of shaft ... 54 in. 60 in. 72 in. 78 in.

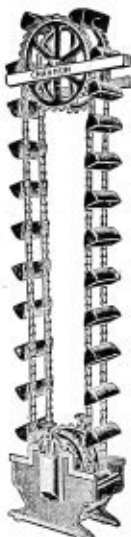
Price per pair with grease cups. . . . \$40.00 \$42.00 \$68.00 \$78.00

Price does not include sprockets or pulleys which are furnished at regular prices.

BUCKET ELEVATORS FOR ALL CLASSES OF WORK



**No. 1
Single
Strand**



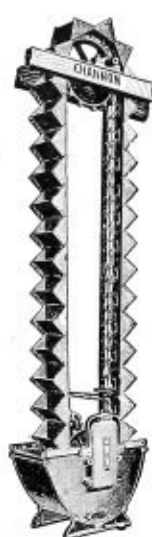
**No. 2
Double
Strand**



**No. 3
Belt
Type**



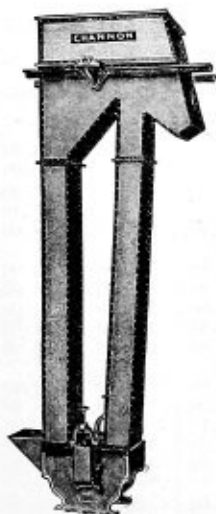
**No. 4
Deflecting Wheel-
Perfect Discharge**



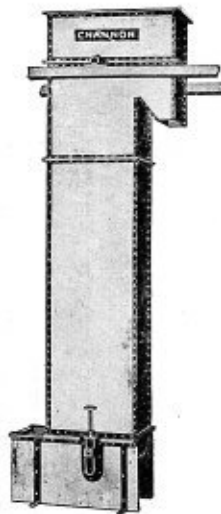
**No. 5
Continuous
Bucket**

Before we can quote intelligently, we must know: 1.—Nature of material to be handled. 2.—Quantity in pounds, or bushels or cubic feet per hour. 3.—Height material is to be elevated and whether perpendicular, or at what incline. 4.—Speed and diameter of shaft from which power to drive elevator is taken. 5.—State whether elevator is to be driven from top or bottom. 6.—What type is wanted, see cuts above.

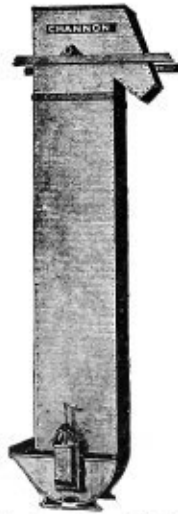
ELEVATOR LEGS



**Double Leg Steel Casing
Style No. 6**



**Single Leg Steel Casing
Style No. 7**



**Single Leg Wood Casing
Style No. 8**

Steel Elevator Legs are now used extensively where hot, dusty or damp materials are handled. No. 6 style is made with either square or round casings. Legs can be made any style or of any gauge of metal desired.

STANDARD PORTABLE CRUSHED STONE ELEVATORS



Built with wood frames in lengths up to 100 feet. Lengths less than 31 feet built with single head, over 30 feet, with geared head, unless otherwise specified. The shafting and head and boot pulleys are of liberal dimensions, the idler rolls of steel, and all bearings proportioned for strength and long service. Suitable take-ups are provided at foot of elevator to take up slack of the belt, and the belts used are of the best quality, thickness of belt varying with length of same.

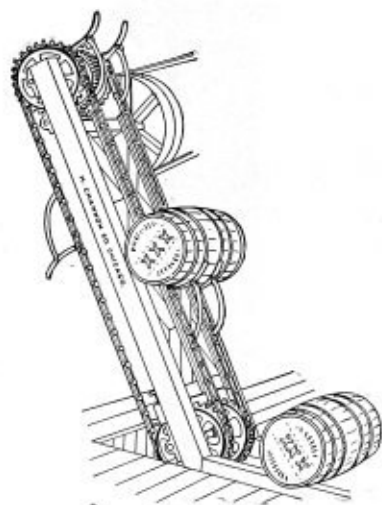
The following table gives sizes and dimensions of our standard elevators.

Capacity of Elevator in Tons per Hour	Length between Centers of Head and Foot Shaft	Size and Gauge of Buckets	Width of Belt	Total Weight	R. P. M. Pinion Shaft	R. P. M. Head Shaft
30	30 ft.	9x9 — No. 16	10 in.	3400 lbs.	171	32
50	30 ft.	13x10 — No. 14	14 in.	4900 lbs.	197	32
80	30 ft.	15x11 — No. 14	16 in.	5900 lbs.	154	27
120	30 ft.	18x13 — No. 12	20 in.	6300 lbs.	131	23
200	30 ft.	24x14 — No. 12	26 in.	8100 lbs.	135	21
325	30 ft.	30x17 — No. 10	32 in.	8500x lbs.	123	19
450	30 ft.	36x18½ — No. 7	38 in.	9500x lbs.	109	19
600	30 ft.	42x19 — ¾ in.	44 in.	10500 lbs.	112	19

STANDARD BARREL, KEG AND SACK ELEVATOR

The list prices below are for machinery only and do not include driving pulleys or belt but does include balance of driving machinery shown in cut. The woodwork is simple and can be constructed economically on the ground.

Styles A and B have 16-inch wheels and small arms, A being for light or small sacks, B for brewery work, kegs, etc., up to barrels. Styles C and D have 24-inch wheels and large arms, C being for empty or light barrels, D for general barrel elevator work.



Also Furnished with Straight Arms for Boxes, etc.

Style	Length from C. to C. in feet	3 Arms	4 Arms	5 Arms	6 Arms	Ex. Arms per set
A	10	\$ 65.00	\$ 67.60	\$ 70.20	\$ 72.80	\$2.60
	15	71.20	73.80	76.40	79.00	
	20	77.40	80.00	82.60	85.20	
	25	83.60	86.20	88.80	91.40	
	30	89.80	92.40	95.00	97.60	
B	10	76.20	78.80	81.40	84.00	\$2.60
	15	86.20	88.80	91.40	94.00	
	20	96.20	98.80	101.40	104.00	
	25	106.20	108.80	111.40	114.00	
	30	116.20	118.80	121.40	124.00	
C	10	76.30	80.00	83.70	87.40	\$3.70
	15	82.50	86.20	89.90	93.60	
	20	88.70	92.40	96.10	99.80	
	25	94.90	98.60	102.30	106.80	
	30	101.10	104.80	108.50	112.20	
D	10	89.90	93.60	97.30	101.00	\$3.70
	15	99.90	103.60	107.30	111.00	
	20	109.90	113.60	117.30	121.00	
	25	119.90	123.60	127.30	131.00	
	30	129.90	133.60	137.30	141.00	

"STANDARD" STEEL SCREW CONVEYOR

FOR HANDLING GRAIN, FLOUR, COTTON-SEED, MEAL, TAN-BARK ETC.

Diameter inches	Price Per Foot		Standard Lengths, feet	Thickness of Flight, inches	Inside Diameter of Hollow Shaft, inches	Diameter of Coupling, inches	Maximum Capacity Bushels, per hour	Revolutions per minute
	Plain	Galv'd						
4	\$1.00	\$1.28	8	.05	1	1	100	100
6	1.67	2.03	10	.065	1½	1½	300	140
8	2.00	2.68	10	.083	1½	1½	800	150
9	2.00	2.68	10	.083	1½	1½	1000	150
10	2.80	3.48	12	.083	1½	1½	1400	160
12	2.80	3.48	12	.083	1½	1½	2000	160
14	3.75	4.83	12	.109	2	2	3400	160
14	5.08	6.38	12	.109	2	2	3400	160
16	3.75	4.83	12	.134	2	2	5000	160
16	5.08	6.38	12	.134	2	2	5000	160
18	6.15	7.79	12	.187	2	3	6000	160

OUR STANDARD CONVEYORS LISTED ABOVE ARE INTERCHANGEABLE WITH OTHER MAKES

The above price list includes the curved steel lining, one hanger and one coupling with the necessary bolts for each standard length. Standard lengths given include the width of one hanger bearing. Deductions made for any regular parts not desired.

"HELICOID" STEEL CONVEYOR

Made with a continuous flight which is heavier at the base than at the top of the flight and is conceded to be considerably stronger than the "Standard."

Diameter, inches	Price per foot	Standard Lengths, feet	Thickness of Flight at Hollow Shaft, inches	Thickness of Flight at Outer Edge, inches	Inside Diameter of Hollow Shaft, inches	Diameter of Coupling, inches	Maximum Capacity Bushels, per hour	Revolutions per minute
4	\$1.00	8	¼	.06	1¼	1	100	100
6	1.67	10	¼	.063	1½	1½	300	140
8	2.00	10	3-16	.10	1½	1½	800	150
9	2.00	10	3-16	.10	1½	1½	1000	150
10	2.80	12	3-16	.10	1½	1½	1400	160
12	2.80	12	¾	.16	2	2	2000	160
14	3.75	12	¾	.16	3	2 7-16	3400	160
16	5.08	12	¾	3-16	3½	3	5000	160
18	6.15	12	¾	¼	4	3	6000	160

Above prices include Curved Steel Lining, one hanger and one coupling with necessary bolts for each standard length. Standard lengths given include the length of one hanger bearing. Deductions made for any regular parts not desired.

EXTRA HEAVY "HELICOID" STEEL CONVEYOR

For Conveying Sand, Cement, Ore, Coal, Stone Etc.

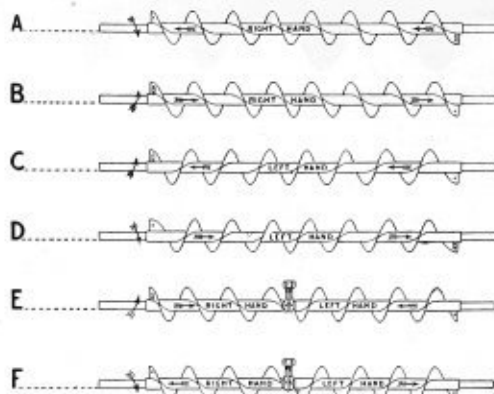
Diameter inches	Price per foot	Standard Lengths, feet	Thickness of Flight at Hollow Shaft, inches	Thickness of Flight at Outer Edge, inches	Inside Diameter of Hollow Shaft, inches	Diameter of Couplings, inches	If made on Solid Shaft, size of Shaft used, inches
4 x	\$1.50	8	3-16	.11	1¼	1	1½
6 x	2.35	10	¼	.125	1½	1½	2½
6 xx	2.75	10	¾	.2	1½	1½	2½
9 x	3.90	10	¾	.172	2	1½	2½
9 xx	4.40	10	¾	.19	2½	2	2 15-16
12 x	4.80	12	¾	.17	2½	2	2 15-16
12 xx	5.65	12	¾	.18	3	3	3 7-16
12 xxx	6.55	12	¾	.25	3½	3 7-16	4

Extra Heavy Helicoid Conveyor is mounted on extra heavy pipe or on solid shaft. When mounted on solid shaft, we furnish special couplings to suit conditions. Above prices include one regular hanger for each standard length of conveyor, but does not include lining. When required this is furnished at an additional price. Special Hangers made to suit different kinds of work.

See next page—Directions for ordering.

HOW TO ORDER SCREW CONVEYORS

Indicate which of the diagrams below is wanted—it will avoid any possible error, also state whether right or left hand. Changing a conveyor end for end does not change it from right to left hand.



Arrows indicate the direction material is conveyed.

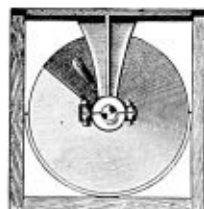
STANDARD CURVED STEEL LINING FOR CONVEYOR BOXES



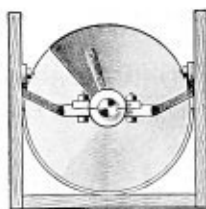
Prices on Perforated or Extra Heavy Plain Lining Will Be Given Upon Application.

Diameter of Conveyor, inches	Price per Lineal Foot	Gauge of Steel	Width of Sheet, inches	Standard Length of Sheet, inches
4	\$ 0.05	22	8½	30
6	.06	22	11¼	30
8	.10	20	16	30
9	.10	20	16	30
10	.12	20	18	30
12	.13	20	20	30
14	.21	18	24	30
16	.23	18	27	30
18	.31	18	36	30

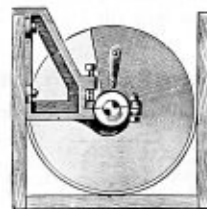
PRICE LIST OF REGULAR CONVEYOR HANGERS



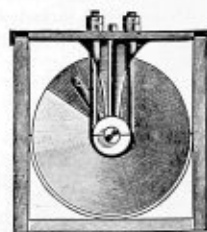
No. 13



No. 14



No. 15

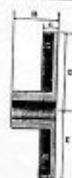


No. 17

Diameter of Conveyor, inches	4	6	8	9	9	10	10	12	12	12	14	14	16	16	18
Diameter of Bearing, inches	1	1½	1½	1½	2	1½	2	2	2½	3	2	2½	2½	3	3
Length of Bearing, inches	1½	2	2	2	2	2	2	2	2½	3	2	2½	2½	3	3
Price—Nos. 13, 14, 15	Each \$9.25	.40	.55	.55	.75	1.10	1.25	1.25	1.50	1.75	2.12	2.50	2.50	3.00	3.50
Price—No. 17	Each \$8.00	.55	.75	.75	.93	1.10	1.25	1.25	1.50	1.75	2.12	2.50	2.50	3.00	3.50

No. 15 hanger made for 9, 12 and 16-inch Conveyors only

4-inch Conveyor furnished with only one style hanger—No. 13



BABBITTED BEARING ENDS FOR CONVEYOR BOXES

This cast iron end for conveyor trough takes the place of a hanger or bearing. It makes a much more rigid bearing for driving ends than a hanger or outside pillow block, and costs less, when the labor and material for the foundation for outside bearing is considered. The bearing is babbitted and furnished with oil tube.

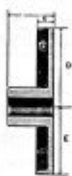
Diameter of Conveyor, inches.	4	6	8	9	9	10	10	12	12	12	14	16	16	18
" " Shaft	1	1 1/2	1 1/2	1 1/2	2	1 1/2	2	2	2 1/16	3	2 1/16	2	3	3
Price.....Each,	\$1.50	2.00	2.75	3.00	3.25	3.75	4.25	6.00	6.50	6.75	7.50	9.00	10.00	12.00



DISCHARGE BOX ENDS

Where it is desired to deliver the material at the end of the conveyor box without cutting a delivery opening in the bottom of the box, we recommend the use of Discharge Box End for conveyor boxes, as shown in cut.

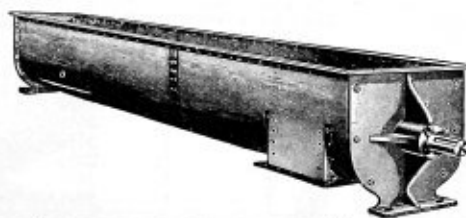
Diameter of Conveyor, inches.	4	6	8	9	9	10	10	12	12	12	14	16	16	18
" " Shaft	1	1 1/2	1 1/2	1 1/2	2	1 1/2	2	2	2 1/16	3	2 1/16	2	3	3
Price.....Each,	\$1.30	1.80	2.50	2.70	2.95	3.40	3.90	5.50	6.00	6.25	7.00	8.25	9.00	11.00



CAST IRON BABBITTED BEARING ENDS FOR STEEL CONVEYOR BOXES

Diameter of Conveyor, inches.	4	6	8	9	9	10	10	12	12	12	14	16	16
" " Shaft	1	1 1/2	1 1/2	1 1/2	2	1 1/2	2	2	2 1/16	3	2 1/16	2	3
Price.....Each,	\$1.50	2.00	2.75	3.00	3.25	3.75	4.25	6.00	6.50	6.75	7.50	9.00	10.00

STEEL CONVEYOR BOXES



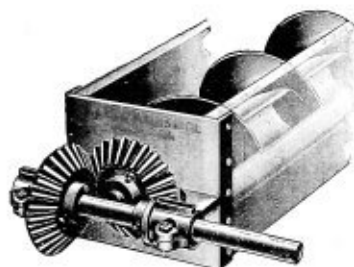
Diameter of Conveyor, inches	Box		"A" inches	"B" inches	Size of Angle Iron, inches	Cover, Gauge of Metal, No.	Price per foot, box	Added Price per foot, for Cover
	Gauge of Metal, No.	Width of Sheet, inches						
4	18	15	5	6 1/2	1 x 1 x 1/8	20	\$2.00	\$0.35
6	16	20	7	8	1 1/4 x 1 1/4 x 3/16	18	2.25	.40
8	14	24	9	9 1/2	1 1/2 x 1 1/2 x 3/16	16	2.50	.45
9	14	28	10	11 3/16	1 1/2 x 1 1/2 x 3/16	16	2.75	.50
10	14	30	11	11 7/8	1 1/2 x 1 1/2 x 3/16	16	3.00	.55
12	12	36	13	14 5/8	2 x 2 x 3/16	16	3.75	.60
14	12	42	15	16 1/2	2 x 2 x 3/16	16	4.25	.70
16	12	48	17	19 3/8	2 x 2 x 3/16	16	4.50	.80
18	10	54	19	21 1/8	2 1/2 x 2 1/2 x 1/4	14	6.50	1.20

Prices named above are for plain boxes without gates or openings. If gates or openings are needed, an extra charge will be made.

In asking for prices complete be sure to state kind of material to be handled and the number of openings in the box, both for receiving and delivering material.

H.Channon Company. Chicago.

COUNTERSHAFT BOX END FOR SCREW CONVEYOR—FIG. 29

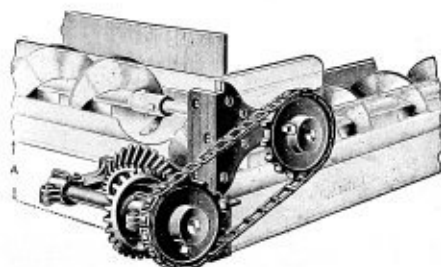


The bearings are so arranged that the projecting shaft to which the sprocket wheel or driving pulley is to be attached can extend on either side of the box, and the position of the mitre gear on the short countershaft can be shifted from one side to the other, so that the motion of the conveyor can be changed, and either right or left hand conveyor used as desired.

Price includes the cast-iron box end, necessary drive end projection for the conveyor mitre gears, and short countershaft projecting far enough to take sprocket wheel or pulley.

Size of conveyor, inches.....	4	6	9	10	12	14	16	16
Diam. of drive end ".....	1	1½	1½	2	2	2	2	3
Price each.....	\$8.00	10.00	15.00	21.00	26.00	32.00	40.00	45.00

IMPROVED RIGHT ANGLE CONVEYOR DRIVE—FIG. 30



This device allows the delivering conveyor to carry its full capacity, and drop the material into the receiving conveyor without any danger of clogging or choking up.

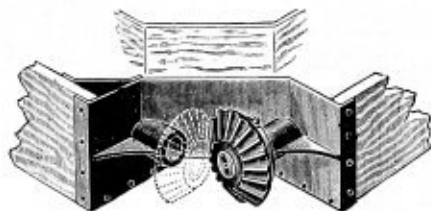
The power to drive both conveyors may be applied to either of the shafts shown. In using this device the delivering conveyor should be placed a few inches above the box for the receiving conveyor.

We furnish castings forming box ends and bearings, as shown; also the mitre gears, mitre gear shaft, sprocket wheels, chain, set collar, and driving ends of proper length ready to set up at the angle of the two wooden boxes.

Size Conveyor	Price	Dimension "A," inches	Diameter, Both Drive Ends, inches	Standard Projection from Conveyor, Long Drive End, inches	COUNTERSHAFT	
					Diameter	Length
4	\$11.50	3½	1	10¾	1	13¾
6	17.50	4¾	1½	13½	1½	17½
9	21.00	6¾	1½	15¾	1½	17¾
10	30.00	7	2	18¼	2	20¼
12	38.00	9¼	2	20¼	2	23¾
14	51.00	9¾	2 7/16	23½	2	25¾
16	65.00	11¼	2	28	2 7/16	33½
16	75.00	11¼	3	28	2 7/16	33½

An extra charge is made when countershafts or drive ends are of special lengths.

MITRE GEAR BEARING ENDS FOR RIGHT-ANGLE CONVEYORS—FIG. 34

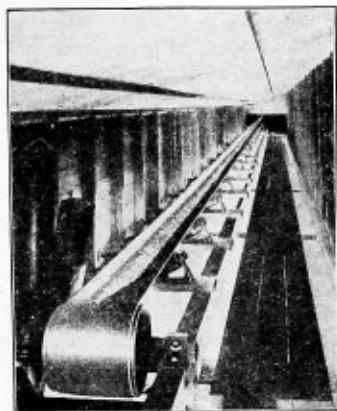


Where it is possible to accommodate the slight difference in level of conveyors, we recommend the use of the Fig. 30 drive shown above. If both conveyors must be on same level, Fig. 34 style can be used.

It is necessary, however, in order to secure the delivery from one conveyor to the other, that the proper "hand" of conveyor be used, so that the tendency of a screw conveyor to carry on one side of the shaft will be taken advantage of to assist the end flights of the conveyor in pushing the material past the corner.

Price List, including cast-iron bearings and boxes as shown above with mitre gears for same.....	{	For 4-inch conveyor, price.....	\$ 8.00
		" 6 " " " ".....	10.00
		" 9 " " " ".....	18.00
		" 12 " " " ".....	24.00

BELT CONVEYORS

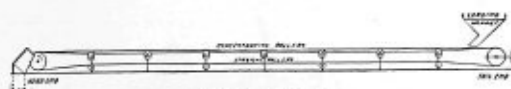


A belt conveyor system consists of the rubber or cotton conveying belt, head and tail pulleys, carriers and return rollers with their stands, bearings, shafts and take-ups; also such additional fixtures, such as discharging trippers, loading hoppers, etc., as may be required by the existing conditions.

As each installation must be designed especially for the work we must have full information and sketches to enable us to quote.

State length, degree of incline if any, capacity per hour, kind and nature of material, specifying average size and largest piece, and whether hot or cold, wet or dry; how will material be fed on to belt and at how many points; state where material is to be discharged, at how many points and into what; give speed and location of line shaft and send sketch showing conveyor and how it is to be supported.

STANDARD DESIGNS



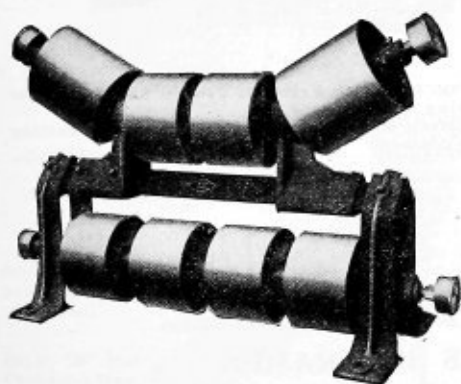
Design No. 1

Level or inclined conveyor using either flat or troughed belt. Receives material at one end and discharges at the other.

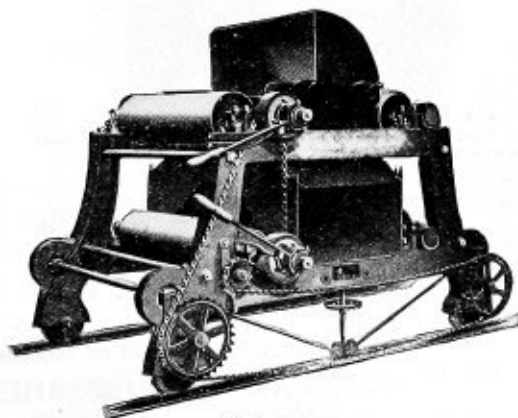


Design No. 6

Level conveyor using either flat or troughed belt. Receives material at one end and discharges by means of tripper at any intermediate point.



Troughing and Return Roll Carriers



Tripper



Iron Concentrating Roller Carrier

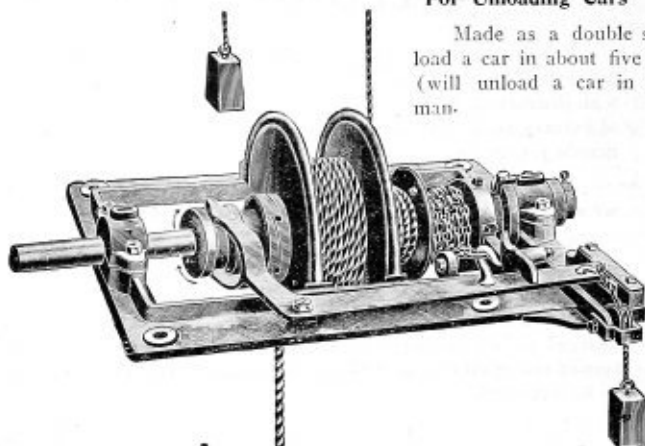


Plain Wooden Roller with Turned Shaft

CLARK AUTOMATIC POWER GRAIN SHOVEL

For Unloading Cars

Made as a double shovel to be operated by two men (will unload a car in about five minutes), or as single shovel illustrated (will unload a car in about fifteen minutes), operated by one man.



PRICE LIST

These prices include shovel mechanism, iron frame, five-foot shaft, weights, one sheave for floor of building, two sheaves for car door and one wooden shovel; but as we cannot tell speed of driving shaft, distance of machine from car or location of upper weight, driving pulley, ropes and additional sheaves will be charged extra.

Single power shovel.....\$100.00
Double power shovel.....200.00

BELT DRIVEN CAR PULLERS

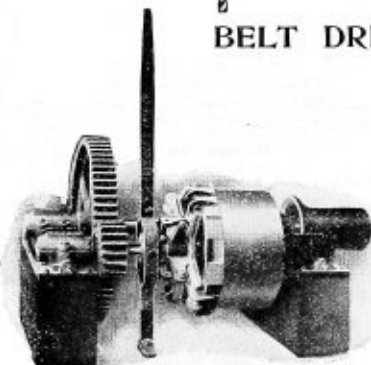


Fig. 168 with Friction Clutch.
Fig. 169 (not shown) is the same, except that it has a Jaw Clutch.

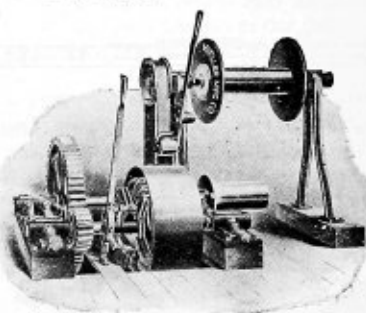


Fig. 170 with Friction Clutch and Drum for hauling in slack rope.
Safety Drum can be suspended from ceiling if so desired.

Size, No.	Pulling Capacity, Loaded Cars	Size of Pulley on Pinion Shaft, inches	Speed Pinion Shaft, R. P. M.	Fig. 169 with Jaw Clutch	Fig. 169 with Safety Device	Fig. 168 with Friction Clutch	Fig. 170 with Safety Drum
1	3	16x6	225	\$100.00	\$160.00	\$120.00	\$180.00
2	8	20x10	225	150.00	210.00	195.00	255.00
3	12	24x12	200	230.00	300.00	290.00	360.00
4	18	30x14	200	350.00	425.00	400.00	.....

Capacities given are based on Straight and Level Track in good Condition

CAR PULLER SHEAVES IN FRAMES



Fig. 171—Double
GROOVE IN SHEAVES MADE FOR MANILA OR WIRE ROPE



Fig. 171—Single

12 inch Diameter Sheaves. Each.....	Single List, \$15.00	Double \$30.00
18 inch Diameter Sheaves. Each.....	25.00	50.00

"Ajax," Manila and other Car Puller Ropes quoted upon application

FLEXIBLE CAR LOADING SPOUTS

With Lug
Connections
OpenWill Turn to Any
AngleWith Chain
Connections
Closed

Style "A"

With wrought lug
connections. Swivel
joint on hopper sec-
tion.

Style "A" For Gen-
eral Use.

Style "B" For Use
Where Loading
Space Is Limited.



Style "B"

Diameter, inches	Length, feet	Price Each, Gauge Steel			
		No. 18	No. 16	No. 14	No. 12
6	5	\$ 8.50	\$10.00	\$13.00	\$17.00
6	6	10.20	12.00	15.60	20.40
6	8	13.60	16.00	20.80	27.20
8	6	10.50	12.00	16.00	21.00
8	8	14.00	16.00	21.35	28.00
8	10	17.50	20.00	26.70	35.00
10	6	11.60	12.85	16.35	21.40
10	7	13.50	15.00	19.00	25.00
10	8	15.45	17.15	21.75	28.55
10	10	19.30	21.45	27.20	35.70
12	8	18.50	20.00	25.00	30.00
12	10	23.10	25.00	31.30	37.50

In ordering give size of wooden spout to which the flexible spout is to be fitted.

Any length or diameter furnished to order.

Always state whether Lug or Chain connections are desired.

DISTRIBUTING SPOUTS

For Elevator Head

Style "A" (as
per cut) is all
Steel

Style "B" Has
Cast Iron Hopper
and Elbow

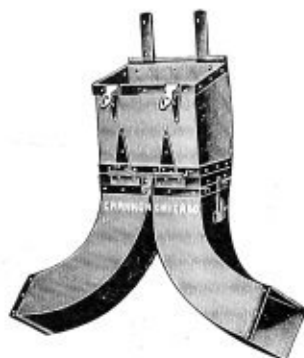


Diameter Spout, inches	Rod to Discharge Centers	Top of Hopper to Bottom of Spout	Price Each	
			Style "A"	Style "B"
6½	30	33	\$ 9.00	\$12.00
9	36	41¼	12.00	16.00
12	42	47½	16.00	20.00

The measurements from center of rod to center of discharge can be increased or decreased when so ordered.

BIFURCATED CAR LOADING SPOUT

With Square Outlets



Price complete..... Each, \$50.00

SEELEY CAST IRON TURN HEADS

With Hoppers for Elevator
Heads

Size, inches	Price Complete, Each
6½	\$10.00
9	12.00
12	15.00
14	21.00
16	30.00

ADJUSTABLE BIN GATES

The gate slides in grooves and can be set in any position desired, the dog holding it in place wherever set.

Size, inches	Price, Each, Without Spout	Price, Each, With Spout
12x14	\$2.50	\$3.00
14x16	3.00	3.60
16x18	3.50	4.20
18x20	4.00	4.80
20x22	4.50	5.40
22x24	5.00	6.00



PLAIN
BIN
BOTTOMS

Size, inches	Price Complete, Each	Size inches	Price Complete, Each
9	\$ 7.00	18	\$16.00
10	8.00	20	20.00
12	10.00	24	28.00
14	12.00	.....	.....



CITY GRAIN ELEVATOR.

DUMP SCALES

For use in elevators and grain warehouses for convenient and quick weighing and dumping of grain.

The platforms of these scales are entirely free from levers, so that dump can be built in the platform.

Prices are exclusive of timber and foundation.

Beam fixtures when furnished, extra.

Patent controllable dump irons for hold-unloading the grain, furnished extra. Prices on application.

Beams graduated by 2½-pound marks.

No.	Capacity, tons	Size of Platform, feet	Distance from Edge of Platform to Beam Rod	Price Single Beam	Price Double Beam
2211	4	14 x 8	2 ft. 8 in.	\$165.00	\$175.00
2213	6	14 x 8	2 " 8 "	225.00	240.00
2215	6	22 x 8	3 " 4 "	250.00	265.00

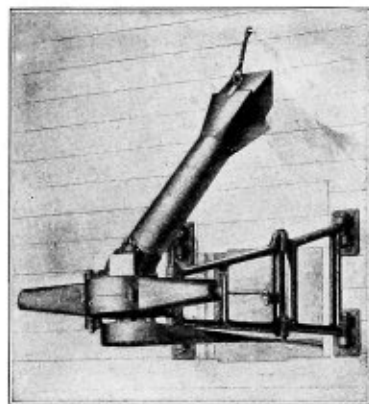
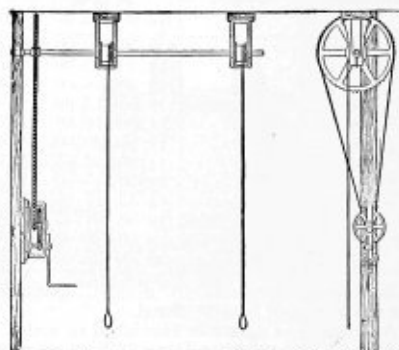
See Wagon and Hay Scales listed elsewhere.

NO. 225 OVERHEAD WAGON DUMP

This Dump is of neat and compact design and easy to operate.

It is durable and a great improvement over the old style dump with chains, and costs no more.

Price.....\$45.00



In Position Ready to Load Car

THE IMPROVED IDEAL CAR-LOADER

Loads Both Ends of a Car at the Same Time

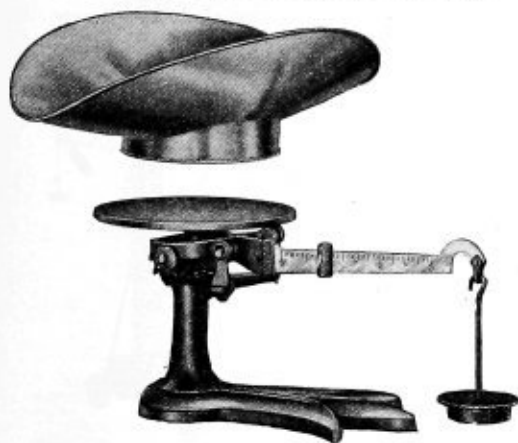
This Car-Loader is attached to the elevator wall by a set of folding brackets and when not in use is folded into elevator. To put in position for operation the Loader is pushed or pulled through the opening in elevator wall; this operation causes the folding brackets to unfold, and allows the Loader to come into proper position just within the car door. When in this position the brackets are held rigid by a turnbuckle which has a hooked iron rod in each end. After placing this rod in its proper place a few turns of the turnbuckle holds the Loader and brackets perfectly rigid. After putting on the belt and placing the loading spout in position as shown, the Loader is ready for operation. Owing to the manner in which it is handled, it has the following advantages over other Loaders: It does not require a block and tackle to pull it in and out of car. It does not have to be lifted in and out of car. It is entirely independent of car for any support. Less power is required to operate, as in its operation the principle of centrifugal force is applied to the grain, instead of the direct striking force used in others.

Price, including loader brackets, jack and 20 feet of belting...\$125.00

Capacity about 2,000 bushels per hour.

Horse Power required, 1 to 4, depending upon amount of grain handled.

FAMILY OR STORE SCALES



Can be used either with or without scoop. Beam is graduated $\frac{1}{2}$ ounce to 3 pounds. The tare beam on double beam also has the same graduation.

No.	Capacity, pounds	Style	Price, Each
570	36	Single beam, seamless tin scoop	\$10.00
572	36	" " " brass "	11.00
574	36	Double " " tin "	11.00
576	36	" " " brass "	12.00
536	62	Single " " tin "	12.00
538	62	" " " brass "	13.50
540	62	Double " " tin "	13.00
542	62	" " " brass "	14.50

UNION OR SCOOP SCALES



A good general purpose scale for all trades, furnished with either single or double beam, capacity of 240 pounds by $\frac{1}{4}$ -pound marks when weighing on large platform, or 30 pounds by $\frac{1}{2}$ -ounce marks when load is placed in scoop or on small platform.

Platform, $10\frac{1}{2} \times 13\frac{1}{2}$ inches.

Number	Style	Price, Each
500	Single beam, seamless tin scoop	\$14.00
502	" " " brass "	15.00
504	Double " " tin "	15.00
506	" " " brass "	16.00

EXPRESS PACKAGE SCALES



Full capacity on beam 55 pounds by 1 ounce. Extensively used by express companies and others for weighing packages. Upper bar marked 5 pounds by 1 ounce. Lower bar, 1 pound to 50 pounds.

Number	Size Platform, inches	Price, Each
532	$10\frac{1}{2} \times 12$	\$15.00

BOSTON SCALES



A handsomely finished scale. Upper bar is graduated 11 pounds by 1 ounce, lower bar 50 pounds by $\frac{1}{2}$ -pound marks, with weight for balance of capacity of scale 250 pounds.

Platform, $10\frac{1}{2} \times 14\frac{1}{2}$ inches.

Number	Style	Price, Each
518	Heavy tin scoop...	\$24.00
520	Heavy brass scoop...	25.00
522	Seamless tin scoop...	25.00
524	Seamless brass scoop	27.00
521	Enameled platform.	27.00

PLATFORM COUNTING SCALE

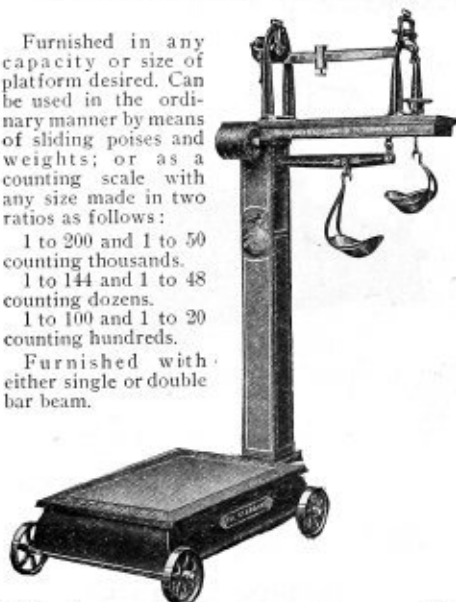
Furnished in any capacity or size of platform desired. Can be used in the ordinary manner by means of sliding poises and weights; or as a counting scale with any size made in two ratios as follows:

1 to 200 and 1 to 50 counting thousands.

1 to 144 and 1 to 48 counting dozens.

1 to 100 and 1 to 20 counting hundreds.

Furnished with either single or double bar beam.



1000 lb. size.....\$53.00

Other sizes on application.

PORTABLE PLATFORM SCALE

Suitable for weighing general merchandise. Scales of 1,000 pounds capacity and larger have pillar braced with iron. Beams graduated 50 pounds by 1/4-pound divisions on scale 400 pounds and 600 pounds capacity, and on larger sizes 100 pounds by 1/2-pound divisions.



With
Brass
Beam
and
Sliding
Poise

Panel board for platform of hard wood.

Capacity, pounds	Platform, inches	WITH WHEELS		WITHOUT WHEELS	
		No.	Price	No.	Price
2500	26x34	1116	\$85.00	1100	\$80.00
2000	25x33	1118	75.00	1102	70.00
1500	21x28	1120	56.00	1104	52.00
1200	20x28	1122	49.00	1106	45.00
1000	17x26	1124	43.00	1108	39.00
800	17x26	1126	38.00	1110	34.00
600	16x25	1128	33.00	1112	30.00
400	15x21	1130	26.00	1114	23.00

PORTABLE DROP LEVER PLATFORM SCALES

Brass Beam Sliding Poise and Set Screw

By means of drop lever all bearings are relieved from wear and danger of breaking the scale mechanism when loading or removing heavy articles from platform.

Scales 1,000 pounds and larger have pillar brace.

Beams graduated 50 pounds by 1/4-pound divisions on scale 400 pounds and 600 pounds capacity, and on larger sizes 100 pounds by 1/2-pound divisions.



No.	Capacity, pounds	Platform, inches	Price, Each
1166	2500	26x34	\$94.00
1168	2000	25x33	82.00
1170	1500	21x28	70.00
1172	1200	20x28	59.00
1174	1000	17x26	51.00
1176	800	17x26	46.00
1178	600	16x25	41.00
1180	400	15x21	34.00

PORTABLE PLATFORM SCALES

With Double Beam and Sliding Poises

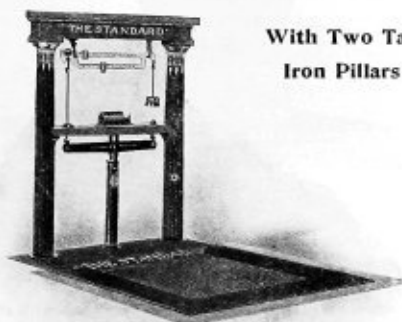
These scales have double beams and so the weight of a truck or container may be reckoned upon separately.

Double beam is graduated with 100 pounds by 1/2-pound on each bar, and poise on lower bar has set screw.



Capacity, pounds	Platform, inches	WITH WHEELS		WITHOUT WHEELS	
		No.	Price, Each	No.	Price, Each
400	15x21	1276	\$30.00	1270	\$27.00
600	16x25	1278	37.00	1272	34.00
1000	17x26	1280	47.00	1274	43.00

DORMANT WAREHOUSE SCALES



With Two Tall
Iron Pillars

Double brass beam, sliding poise and lower poise with set screw. Double beam is convenient to take tare of trucks or cases.

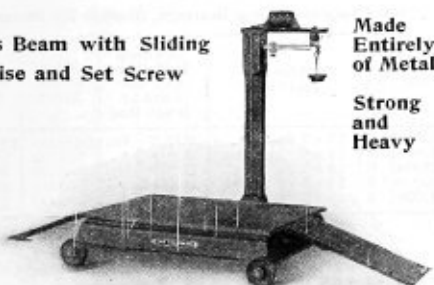
When ordered with scale, a full capacity beam to dispense with loose weights will be furnished at an additional list price of \$20.00.

Furnished with set of marginal irons to protect wood floor surrounding platform.

No.	Capacity, Pounds	Platform, Inches	Platform to Pillar, Inches	Price
1046	5,000x $\frac{1}{2}$	48x48	22	\$170.00
1048	3,500x $\frac{1}{2}$	42x44	12	125.00
1050	2,500x $\frac{1}{2}$	46x37	12	105.00
5054	1,500x $\frac{1}{2}$	42x30	8 $\frac{1}{2}$	100.00
1052	3,500x $\frac{1}{2}$	42x44 With extra long neck	20	135.00

WHEELBARROW SCALES

Brass Beam with Sliding
Poise and Set Screw



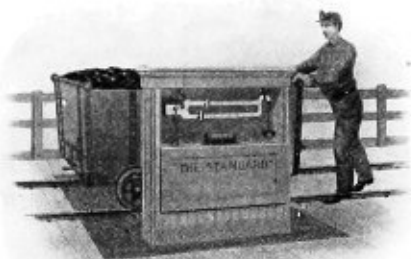
Made
Entirely
of Metal

Strong
and
Heavy

Useful on charging platforms, boiler rooms, etc., for weighing coal ore or other substances in barrows. Beam graduated 100 pounds by 1-pound divisions. Furnished with set of inclines. Size of platform, 42x30 inches.

Capacity, Pounds	With Wheels	Without Wheels
1,000 x 1	No. 1384, \$75.00	No. 1382, \$70.00
1,500 x 1	No. 5389, 85.00	No. 5387, 80.00

MINE OR TIPPLE SCALES



The sizes of platforms of these scales may be varied somewhat from the given dimensions and without increasing cost of scale.

Prices are exclusive of lumber and foundation, which are to be furnished by the purchaser.

No.	Capacity, Tons	Platform	Price Single Beam	Price Double Beam
2166	3	4x4 ft. 1 $\frac{1}{2}$ in.	\$155.00	\$163.50
2190	3	5x5 " " $\frac{1}{4}$ "	155.00	163.50
2145	4	4x10 " " 1 $\frac{1}{4}$ "	170.00	180.00
2188	4	6x4 " " 1 $\frac{1}{4}$ "	170.00	180.00
2162	5	7x4 " " 9 $\frac{1}{4}$ "	185.00	195.00
2184	6	6x4 " " 1 $\frac{1}{4}$ "	205.00	215.00
2074	6	8x6 " " $\frac{3}{8}$ "	215.00	225.00
2072	8	8x6 " " $\frac{3}{8}$ "	250.00	260.00
2156	10	10x4 " " 1 $\frac{1}{4}$ "	280.00	290.00

EXTRA HEAVY PORTABLE FOUNDRY SCALES

For general foundry, factory and mill use. Brass beam with sliding poise and set screw and graduated 100 pounds by $\frac{1}{2}$ -pound divisions.

Mounted on wheels 9 $\frac{1}{2}$ inches in diameter, making platform at a convenient height.

Also furnished with drop lever for relieving the bearings when load is being placed on platform.

Face of pillar protected part way with iron plate and pillar braced.



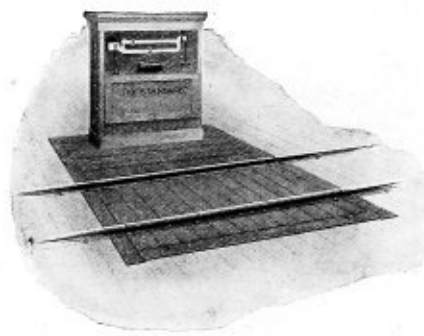
With Wheels

No.	Capacity, Pounds	Platform, Inches	Price
1208	3,000 x $\frac{1}{2}$	31 x 40	\$125.00
5209	4,000 x $\frac{1}{2}$	31 x 50	140.00
5210	6,000 x $\frac{1}{2}$	31 x 40	165.00

Can be furnished with drop lever if wanted.

Smaller Scales in all styles quoted upon request

INDUSTRIAL RAILWAY SCALES



Prices are exclusive of lumber and foundation, which are to be furnished by the purchaser.

The sizes of platforms of these scales may be varied somewhat from the dimensions given and without increasing cost of the scale.

No.	Capacity, Tons	Platform	Price Single Beam	Price Double Beam
2,192	2	5 x 4 ft.	\$135.00	\$143.50
2,166	3	6 x 3 " 10 in.	155.00	163.50
2,190	3	8 x 4 " 6 1/2 "	155.00	163.50
2,164	4	5 x 4 " 0 "	170.00	180.00
2,188	4	6 x 4 " 11 1/4 "	170.00	180.00
2,163	4	10 x 4 " 1 1/4 "	170.00	180.00
2,180	5	5 x 4 " 0 "	185.00	195.00
2,162	5	6 x 4 " 11 1/4 "	185.00	195.00
2,184	6	7 x 4 " 9 1/4 "	205.00	215.00
2,158	8	6 1/2 x 4 " 10 3/4 "	240.00	250.00
2,156	10	6 x 4 " 11 1/4 "	270.00	280.00

STEEL PLANT AND BLAST FURNACE SCALES

Extra heavy iron frame, R. R. pattern, with brass-faced beam and latch poise.

CAPACITY ALL ON BEAM



No.	Length Feet	Capacity, Tons	Price	No.	Length Feet	Capacity, Tons	Price
6,500	6	15	\$365.00	6,542	10	20	\$425.00
6,502	6	20	375.00	6,544	10	30	450.00
6,504	6	30	400.00	6,546	10	40	475.00
6,506	6	40	425.00	6,548	10	50	500.00
6,508	6	50	450.00	6,562	12	20	450.00
6,522	8	20	400.00	6,564	12	30	475.00
6,524	8	30	525.00	6,566	12	40	500.00
6,526	8	40	450.00	6,568	12	50	525.00
6,528	8	50	475.00	.....	.....	.....	.....

Double railroad beam, extra..... \$20.00
Short iron pillars with shelf and stand, extra..... 50.00

Small Scales in all styles quoted upon request

WAGON AND HAY SCALES



The sizes of platform of these scales may be varied somewhat from dimensions given without increasing the cost of the scales.

Trusses for platform timbers are furnished with all scales having platform 18 feet or longer, except Nos. 1,846 and 2,100.

We furnish extensions to carry the beams unusual distances from the platform at additional cost.

All prices are exclusive of the cost of timber and foundation, which is to be paid by purchaser.

No.	Capacity, Tons	Size of Platform	Distance from Edge of Platform to Beam Rod	Price Single Beam	Price Double Beam
1,800	20	22 x 10 ft. 3 1/2 in.	2 ft. 1 in.	\$570.00	\$585.00
1,836	20	20 x 7 " 9 1/2 "	4 " 1 1/2 "	520.00	535.00
1,922	20	16 x 7 " 10 "	1 " 10 1/2 "	450.00	465.00
1,802	15	22 x 10 " 3 1/2 "	2 " 1 "	440.00	455.00
1,838	15	18 x 8 " 3 "	4 " 5 1/2 "	420.00	435.00
1,924	15	14 x 8 " 4 1/2 "	2 " 1 "	390.00	405.00
1,806	10	22 x 10 " 3 1/2 "	2 " 1 "	365.00	380.00
1,843	10	18 x 8 " 3 "	4 " 5 1/2 "	350.00	365.00
1,928	10	14 x 8 " 4 1/2 "	2 " 3/4 "	300.00	315.00
1,845	8	20 x 7 " 9 1/2 "	4 " 1 1/2 "	315.00	330.00
1,930	8	16 x 7 " 10 "	1 " 10 1/2 "	275.00	290.00
1,846	6	18 x 8 " 3 "	4 " 5 1/2 "	275.00	290.00
2,100	6	22 x 8 "	2 " 9 "	250.00	265.00
2,110	6	14 x 8 "	2 " 2 1/2 "	225.00	240.00
2,112	5	14 x 8 "	2 " 2 1/2 "	200.00	210.00
2,114	4	14 x 8 "	2 " 2 1/2 "	170.00	180.00

WAGON SCALES

With Improved Loop Bearings, Shallow Pit Pattern

No.	Capacity, Tons	Size of Platform	Distance from Edge of Platform to Beam Rod	Price Single Beam	Price Double Beam
6,000	10	15 x 7 ft.	2 ft. 7 in.	\$290.00	\$305.00
6,002	8	14 x 7 " 2 1/4 in.	2 " 8 1/4 "	265.00	280.00
6,004	6	15 x 7 "	2 " 7 "	240.00	255.00
6,005	6	14 x 7 " 2 1/4 in.	2 " 8 1/4 "	240.00	255.00
6,006	5	15 x 7 "	2 " 7 "	205.00	215.00

WAGON SCALES

Extra heavy iron frame, railroad pattern. Single railroad beam. Capacity on beam.

Beam is similar to illustration on page 110

No.	Capacity, Tons	Platform, Feet	Price
6,580	15	14 x 8	\$450.00
6,582	20	14 x 8	475.00
6,602	20	16 x 8	500.00
6,622	20	18 x 8	525.00
6,624	30	18 x 8	550.00
6,642	20	20 x 8	600.00
6,644	30	20 x 8	625.00
6,683	25	24 x 8	700.00

Double railroad beam, extra..... \$20.00

MACHINISTS' HAND TAPS

SET



Taper

SET



Plug



Bottoming

In ordering **always state** whether U. S., V or Whitworth Standard Thread is wanted. All sizes, lengths and threads not listed are special and subject to special prices.

Size		PRICE		NUMBER OF THREADS TO INCH						Length, inches
Stand- ard	Rough Iron	Each	Per Set	U. S. STANDARD		"V" STANDARD		Whitworth		
				Regular	Threads Also Furnished	Regular	Threads Also Furnished			
1 1/16		\$0.35	\$1.05	64		72	60, 64	60		
1 1/8		.35	1.05			72	56, 60, 64			
3/8		.35	1.05	50		56	48, 50, 54, 60	48		
1/2		.35	1.05			56	48			
5/8		.35	1.05	40	27, 32, 36	40	32, 36, 48, 50	40		
3/4		.35	1.05			40	32, 36			
7/8		.35	1.05	36		32	30, 36, 40	32		
1 1/4		.35	1.05			32	36			
1 1/2		.35	1.05	32	24, 27, 32	24	30, 32, 36	*24		
1 3/4		.35	1.05	32		24	32			
2		.35	1.05	28		24	32	24		
2 1/4		.35	1.05			24	32			
2 1/2		.45	1.35	20	24, 27, 28	20	24, 27, 32	20	2 1/2	
2 3/4		.45	1.35	20		20	24, 27, 32		2 1/2	
3		.45	1.35	20		20	24, 27, 32		2 1/2	
3 1/8		.50	1.50	18	20, 24, 27	18	20, 24, 27, 32	18	2 3/8	
3 1/4		.50	1.50	18		18	20, 24, 27, 32		2 3/8	
3 1/2		.50	1.50	18		18	20, 24, 27, 32		2 3/8	
3 3/4		.55	1.65	16	20, 24, 27	16	14, 18, 20, 24, 27	16	2 3/4	
4		.55	1.65	16		16	14, 18, 20, 24, 27		2 3/4	
4 1/8		.55	1.65	16		16	14, 18, 20, 24, 27		2 3/4	
4 1/4		.60	1.80	14	20, 27	14	12, 16, 20, 24, 27	14	3 1/8	
4 1/2		.60	1.80	14		14	12, 16, 20, 24, 27		3 1/8	
4 3/4		.60	1.80	14		14	12, 16, 20, 24, 27		3 1/8	
5		.70	2.10	13	12, 20, 27	12	13, 14, 16, 20, 24, 27	12	3 1/2	
5 1/8		.70	2.10	13		12	13, 14, 16, 20, 24, 27		3 1/2	
5 1/4		.70	2.10	13		12	13, 14, 16, 20, 24, 27		3 1/2	
5 1/2		.80	2.40	12	18, 27	12	14, 27	12	3 1/2	
5 3/4		.80	2.40	12		12	14, 27		3 1/2	
6		.80	2.40	12		12	14, 27		3 1/2	
6 1/8		.90	2.70	11	12, 18, 27	11	10, 12, 20, 24, 27	11	3 1/2	
6 1/4		.90	2.70	11		11	10, 12, 20, 24, 27		3 1/2	
6 1/2		.90	2.70	11		11	10, 12, 20, 24, 27		3 1/2	
6 3/4		1.05	3.15	11	12, 16	11	10, 12	11	4 1/8	
7		1.05	3.15	11		11	10, 12		4 1/8	
7 1/8		1.20	3.70	10	12, 16, 27	10	12, 20, 27	10	4 1/4	
7 1/4		1.20	3.60	10		10	12, 20, 27		4 1/4	
7 1/2		1.40	4.20	10	12	10	12	10	4 1/2	

(Continued)

*Discount changes.

The indications are that the U. S. Standard form of thread for taps will shortly be adopted by manufacturers throughout the country. To avoid delay in filling your orders, DO NOT FAIL TO STATE THE STYLE OF THREAD WANTED.

All taps with left-hand thread (except common pipe and blacksmith taps) are special and price is governed by quantity purchased.

MACHINISTS' HAND TAPS—Continued

Size		PRICE		NUMBER OF THREADS TO INCH					Length, inches
Stand- ard	Rough Iron	Each	Per Set	U. S. STANDARD		"V" STANDARD		Whitworth	
				Regular	Threads Also Furnished	Regular	Threads Also Furnished		
.....	$\frac{3}{16}$	\$ 1.40	4.20	10	.....	10	12	.....	4 $\frac{13}{16}$
$\frac{7}{8}$	$\frac{3}{16}$	1.60	4.80	9	12, 14, 27	9	10, 12, 27	9	4 $\frac{11}{16}$
.....	$\frac{3}{16}$	1.60	4.80	9	.....	9	10, 12, 27	.....	4 $\frac{11}{16}$
$\frac{1}{2}$	$\frac{3}{16}$	1.80	5.40	9	12	9	12	9	4 $\frac{3}{4}$
.....	$\frac{3}{16}$	1.80	5.40	9	.....	9	12	.....	4 $\frac{3}{4}$
1	$\frac{3}{16}$	2.00	6.00	8	12, 14, 27	8	12, 27	8	5 $\frac{1}{8}$
.....	$1 \frac{1}{2}$	2.00	6.00	8	.....	8	12, 27	.....	5 $\frac{1}{8}$
$1 \frac{1}{8}$	$1 \frac{1}{2}$	2.15	6.45	8	.....	8	12	.....	5 $\frac{1}{8}$
$1 \frac{1}{4}$	$1 \frac{1}{2}$	2.25	6.75	7	12	7	8, 12	7	5 $\frac{1}{16}$
.....	$1 \frac{1}{2}$	2.25	6.75	7	.....	7	8, 12	.....	5 $\frac{1}{16}$
$1 \frac{3}{8}$	$1 \frac{1}{2}$	2.45	7.35	7	.....	7	.....	.....	5 $\frac{1}{16}$
$1 \frac{1}{2}$	$1 \frac{1}{2}$	2.60	7.80	7	12	7	12	7	5 $\frac{3}{4}$
.....	$1 \frac{1}{2}$	2.60	7.80	7	.....	7	12	.....	5 $\frac{3}{4}$
$1 \frac{5}{8}$	$1 \frac{1}{2}$	2.80	8.40	7	.....	7	.....	.....	5 $\frac{3}{4}$
$*1 \frac{3}{4}$	$1 \frac{1}{2}$	3.00	9.00	6	.....	6	.....	6	6 $\frac{1}{16}$
.....	$1 \frac{1}{2}$	3.00	9.00	6	.....	6	.....	.....	6 $\frac{1}{16}$
$1 \frac{7}{8}$	$1 \frac{1}{2}$	3.25	9.75	6	.....	6	.....	.....	6 $\frac{1}{16}$
$1 \frac{1}{2}$	$1 \frac{1}{2}$	3.50	10.50	6	.....	6	.....	6	6 $\frac{3}{8}$
.....	$1 \frac{1}{2}$	3.50	10.50	6	.....	6	.....	.....	6 $\frac{3}{8}$
$1 \frac{3}{4}$	$1 \frac{1}{2}$	4.20	12.60	5 $\frac{1}{2}$	.....	5	.....	5	6 $\frac{1}{4}$
.....	$1 \frac{1}{2}$	4.20	12.60	5 $\frac{1}{2}$	.....	5	.....	.....	6 $\frac{1}{4}$
$1 \frac{3}{4}$	$1 \frac{1}{2}$	5.00	15.00	5	.....	5	.....	5	7
.....	$1 \frac{1}{2}$	5.00	15.00	5	.....	5	.....	.....	7
$1 \frac{7}{8}$	$1 \frac{1}{2}$	5.80	17.40	5	.....	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	7 $\frac{5}{16}$
.....	$1 \frac{1}{2}$	5.80	17.40	5	.....	4 $\frac{1}{2}$	.....	.....	7 $\frac{5}{16}$
2	$2 \frac{1}{2}$	6.70	20.10	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	7 $\frac{5}{8}$
.....	$2 \frac{1}{2}$	6.70	20.10	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	.....	7 $\frac{5}{8}$
$*2 \frac{1}{8}$	$2 \frac{1}{2}$	8.00	24.00	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	8
.....	$2 \frac{1}{2}$	8.00	24.00	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	.....	8
$2 \frac{1}{4}$	$2 \frac{1}{2}$	9.20	27.60	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	4	8 $\frac{1}{4}$
.....	$2 \frac{1}{2}$	9.20	27.60	4 $\frac{1}{2}$	.....	4 $\frac{1}{2}$	.....	.....	8 $\frac{1}{4}$
$2 \frac{3}{8}$	$2 \frac{1}{2}$	10.50	31.50	4	.....	4 $\frac{1}{2}$	.....	4	8 $\frac{1}{2}$
.....	$2 \frac{1}{2}$	10.50	31.50	4	.....	4 $\frac{1}{2}$	.....	.....	8 $\frac{1}{2}$
$2 \frac{1}{2}$	$2 \frac{1}{2}$	11.50	34.50	4	.....	4	.....	4	8 $\frac{3}{4}$
.....	$2 \frac{1}{2}$	11.50	34.50	4	.....	4	.....	.....	8 $\frac{3}{4}$
$2 \frac{3}{4}$	$2 \frac{1}{2}$	13.00	39.00	4	.....	4	.....	4	9
.....	$2 \frac{1}{2}$	13.00	39.00	4	.....	4	.....	.....	9
$2 \frac{3}{4}$	$2 \frac{1}{2}$	14.00	42.00	4	.....	4	.....	3 $\frac{1}{2}$	9 $\frac{1}{4}$
.....	$2 \frac{1}{2}$	14.00	42.00	4	.....	4	.....	.....	9 $\frac{1}{4}$
$2 \frac{7}{8}$	$2 \frac{1}{2}$	15.50	46.50	3 $\frac{1}{2}$	.....	4	.....	3 $\frac{1}{2}$	9 $\frac{1}{2}$
.....	$2 \frac{1}{2}$	15.50	46.50	3 $\frac{1}{2}$	.....	4	.....	.....	9 $\frac{1}{2}$
3	$3 \frac{1}{2}$	17.00	51.00	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	9 $\frac{3}{4}$
.....	$3 \frac{1}{2}$	17.00	51.00	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	.....	9 $\frac{3}{4}$
$*3 \frac{1}{8}$	$3 \frac{1}{2}$	18.75	56.25	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	9 $\frac{3}{4}$
.....	$3 \frac{1}{2}$	18.75	56.25	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	.....	9 $\frac{3}{4}$
$3 \frac{1}{4}$	$3 \frac{1}{2}$	20.50	61.50	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	3 $\frac{1}{4}$	10
.....	$3 \frac{1}{2}$	20.50	61.50	3 $\frac{1}{2}$	.....	3 $\frac{1}{2}$	.....	.....	10
$3 \frac{3}{8}$	$3 \frac{1}{2}$	22.00	66.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	10
.....	$3 \frac{1}{2}$	22.00	66.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	.....	10
$3 \frac{1}{2}$	$3 \frac{1}{2}$	24.00	72.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	10 $\frac{1}{4}$
.....	$3 \frac{1}{2}$	24.00	72.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	.....	10 $\frac{1}{4}$
$3 \frac{5}{8}$	$3 \frac{1}{2}$	26.00	78.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	10 $\frac{1}{4}$
.....	$3 \frac{1}{2}$	26.00	78.00	3 $\frac{1}{4}$	.....	3 $\frac{1}{4}$	.....	.....	10 $\frac{1}{4}$
$3 \frac{3}{4}$	$3 \frac{1}{2}$	28.50	85.50	3	.....	3	.....	3	10 $\frac{1}{2}$
.....	$3 \frac{1}{2}$	28.50	85.50	3	.....	3	.....	.....	10 $\frac{1}{2}$
$3 \frac{7}{8}$	$3 \frac{1}{2}$	30.00	90.00	3	.....	3	.....	3	10 $\frac{1}{2}$
.....	$3 \frac{1}{2}$	30.00	90.00	3	.....	3	.....	.....	10 $\frac{1}{2}$
4	$4 \frac{1}{2}$	32.50	97.50	3	.....	3	.....	3	10 $\frac{3}{4}$
.....	$4 \frac{1}{2}$	32.50	97.50	3	.....	3	.....	.....	10 $\frac{3}{4}$

*Discount changes.

The indications are that the U. S. Standard form of thread for taps will shortly be adopted by manufacturers throughout the country. To avoid delay in filling your orders, DO NOT FAIL TO STATE THE STYLE OF THREAD WANTED.

All taps with left-hand thread (except common pipe and blacksmith taps) are special and price is governed by quantity purchased.

MACHINE OR NUT TAPS



All sizes, lengths and threads not listed are special and subject to special price. See note following list on Machinists' Hand Taps.

Diameter Inches	Price Each	NUMBER OF THREADS TO INCH				
		U. S. Std. Regu- lar	U. S. Threads Also Furnished	V Std. Regu- lar	V Threads Also Furnished	Whit- worth Regu- lar
1/16	\$ 0.60	40	27-32-36			
1/8	1.00	32	24-27-32	24	32	24
3/16	1.60	24	24-27-28	20	24	20
1/4	2.00	18	20-24-27	18	16-20-24	18
5/16	2.40	16	20-24-27	14	14-18	14
3/8	3.00	14	20-27	12	12-16	12
7/16	3.60	12	12-20-27	12	12	12
1/2	4.20	11	18-27	11	10-12	11
5/8	4.80	10	16-27	10	12	10
3/4	5.40	9	14-27	9	10-12	9
7/8	6.00	8	14-27	8	12	8
1	6.60	7		7	8	7
1 1/16	7.20	6		6		6
1 1/8	7.80	5 1/2		5 1/2		5 1/2
1 1/4	8.40	5		5		5
1 1/2	9.00	4 1/2		4 1/2		4 1/2
1 3/4	9.60	4		4		4
2	10.20	4		4		4
2 1/4	10.80	3 1/2		3 1/2		3 1/2
2 1/2	11.40	3		3		3
2 3/4	12.00	3		3		3
3	12.60	3		3		3
3 1/4	13.20	3		3		3
3 1/2	13.80	3		3		3
3 3/4	14.40	3		3		3
4	15.00	3		3		3
4 1/4	15.60	3		3		3
4 1/2	16.20	3		3		3
4 3/4	16.80	3		3		3
5	17.40	3		3		3
5 1/4	18.00	3		3		3
5 1/2	18.60	3		3		3
5 3/4	19.20	3		3		3
6	19.80	3		3		3
6 1/4	20.40	3		3		3
6 1/2	21.00	3		3		3
6 3/4	21.60	3		3		3
7	22.20	3		3		3
7 1/4	22.80	3		3		3
7 1/2	23.40	3		3		3
7 3/4	24.00	3		3		3
8	24.60	3		3		3

TAPPER TAPS



All sizes and lengths not listed are special and subject to special prices. See note following list on Machinists' Hand Taps.

Diameter	Length of Thread	NO. OF THREADS TO INCH					WHOLE LENGTH—PRICE EACH				
		U. S. Standard Regu.	U. S. Std. Also	Furn'd	V. Std. dard	Whitworth Std. dard	11 inch	12 inch	14 inch	15 inch	
1/16	1 1/2	20	28	20	20	20	\$0.70	\$0.75	\$0.80	\$0.90	
1/8	1 1/2	20		20	20	20	.70	.75	.80	.90	
3/16	1 1/2	18	24	18	18	18	.80	.85	.90	1.00	
1/4	1 1/2	16	24	16	16	16	.90	.95	1.00	1.10	
5/16	1 1/2	14	20	14	14	14	.90	.95	1.00	1.10	
3/8	1 1/2	*13	12-20	*12	12	12	1.00	1.05	1.15	1.25	
7/16	1 1/2	12	18	12	12	12	1.12	1.15	1.25	1.35	
1/2	1 1/2	11	18	11	11	11	1.20	1.35	1.45	1.55	
5/8	1 1/2	11	18	11	11	11	1.30	1.35	1.45	1.55	
3/4	1 1/2	10	16	10	10	10	1.45	1.50	1.65	1.75	
7/8	1 1/2	10	16	10	10	10	1.45	1.50	1.65	1.75	
1	1 1/2	9	14	9	9	9	1.62	1.70	1.80	1.95	
1 1/16	1 1/2	9		9			1.62	1.70	1.80	1.95	
1 1/8	1 1/2	9		9			1.80	1.85	2.00	2.10	
1 1/4	1 1/2	9		9			.80	.85	.90	1.00	
1 1/2	1 1/2	8	14	8	8	8	.90	.95	1.00	1.10	
1 3/4	1 1/2	8		8			.65	.70	.75	.80	
2	1 1/2	8		8			.35	.45	.60	.75	
2 1/4	1 1/2	7		7			.35	.45	.60	.75	
2 1/2	1 1/2	7		7			.70	.75	.80	.90	
2 3/4	1 1/2	7		7			.70	.75	.80	.90	
3	1 1/2	6		6			.75	.80	.85	.95	
3 1/4	1 1/2	6		6			1.00	1.05	1.15	1.25	
3 1/2	1 1/2	6		6			1.00	1.05	1.15	1.25	
3 3/4	1 1/2	6		6			1.20	1.25	1.35	1.45	
4	1 1/2	5 1/2		5			1.20	1.25	1.35	1.45	
4 1/4	1 1/2	5 1/2		5			1.30	1.35	1.45	1.55	
4 1/2	1 1/2	5		5			1.30	1.35	1.45	1.55	
4 3/4	1 1/2	5		5			1.45	1.50	1.65	1.75	
5	1 1/2	5		5			1.45	1.50	1.65	1.75	
5 1/4	1 1/2	5		5			1.62	1.70	1.80	1.95	
5 1/2	1 1/2	5		5			1.80	1.85	2.00	2.10	
5 3/4	1 1/2	5		5			.80	.85	.90	1.00	
6	1 1/2	5		5			.90	.95	1.00	1.10	
6 1/4	1 1/2	4 1/2		4 1/2			.95	1.00	1.05	1.15	
6 1/2	1 1/2	4 1/2		4 1/2			1.00	1.05	1.10	1.20	
6 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.10	1.20	
7	1 1/2	4 1/2		4 1/2			1.20	1.25	1.35	1.45	
7 1/4	1 1/2	4 1/2		4 1/2			1.20	1.25	1.35	1.45	
7 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
7 3/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
8	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
8 1/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
8 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
8 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
9	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
9 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
9 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
9 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
10	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
10 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
10 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
10 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
11	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
11 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
11 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
11 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
12	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
12 1/4	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
12 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
12 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
13	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
13 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
13 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
13 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
14	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
14 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
14 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
14 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
15	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
15 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
15 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
15 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
16	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
16 1/4	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
16 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
16 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
17	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
17 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
17 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
17 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
18	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
18 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
18 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
18 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
19	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
19 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
19 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
19 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
20	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
20 1/4	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
20 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
20 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
21	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
21 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
21 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
21 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
22	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
22 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
22 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
22 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
23	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
23 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
23 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
23 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
24	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
24 1/4	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
24 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
24 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
25	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
25 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
25 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
25 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
26	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
26 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
26 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
26 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
27	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
27 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
27 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
27 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
28	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1.75	
28 1/4	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
28 1/2	1 1/2	4 1/2		4 1/2			1.62	1.70	1.80	1.95	
28 3/4	1 1/2	4 1/2		4 1/2			1.80	1.85	2.00	2.10	
29	1 1/2	4 1/2		4 1/2			.80	.85	.90	1.00	
29 1/4	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
29 1/2	1 1/2	4 1/2		4 1/2			.90	.95	1.00	1.10	
29 3/4	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
30	1 1/2	4 1/2		4 1/2			1.00	1.05	1.15	1.25	
30 1/4	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
30 1/2	1 1/2	4 1/2		4 1/2			1.12	1.15	1.25	1.35	
30 3/4	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
31	1 1/2	4 1/2		4 1/2			1.20	1.35	1.45	1.55	
31 1/4	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
31 1/2	1 1/2	4 1/2		4 1/2			1.30	1.35	1.45	1.55	
31 3/4	1 1/2	4 1/2		4 1/2			1.45	1.50	1.65	1	

PULLEY TAPS



All sizes, lengths and threads not listed are special and subject to special prices. See note following list on Machinists' Hand Taps

Diameter, inches	NO. OF THREADS TO INCH		WHOLE LENGTH—PRICE EACH								
	United States Standard	V Standard	6-inch	8-inch	10-inch	12-inch	14-inch	16-inch	18-inch	20-inch	24-inch
1/16	20	20	\$0.65	\$0.70	\$0.80	\$0.90					
1/8	18	18	.75	.80	1.00	1.20					
3/16	16	16	.80	.90	1.10	1.30	\$1.40	\$1.55	\$1.70		
1/4	14	14	.90	1.00	1.20	1.40	1.50	1.65	1.80		
5/16	12-13	12-13	1.00	1.15	1.30	1.45	1.60	1.75	1.90	\$2.05	
3/8	12	12	1.10	1.30	1.45	1.55	1.70	1.85	2.05		\$2.35
7/16	11	11	1.20	1.35	1.50	1.60	1.75	1.90	2.10		
1/2	11	11	1.30	1.45	1.55	1.70	1.90	2.05	2.20		\$2.55
5/8	10	10	1.40	1.50	1.60	1.80	2.00	2.15	2.30		
3/4	10	10	1.60	1.70	1.80	2.00	2.20	2.35	2.50		\$2.75
7/8	9	9	1.80	1.90	2.10	2.30	2.50	2.65	2.80		
1	9	9	2.00	2.10	2.30	2.50	2.70	2.90	3.10		\$3.30
1 1/16	8	8	2.25	2.30	2.50	2.70	2.90	3.10	3.30	3.50	

MACHINE SCREW TAPS



These taps will be furnished in sets if desired.
Less than six of a size and thread will be charged at prices for single taps.

Sizes and threads not listed will be subject to special prices.
Price is lower on dozen lots or more.

Size of Screw Gauge	Standard No. of Threads	Threads also Furnished	Price	
			Each	Dozen
No. 1	56	56, 60, 64, 72	\$0.35	\$4.00
" 1½	56	56	.35	4.00
" 2	48	48, 64	.35	4.00
" 3	48	40, 56	.35	4.00
" 4	36	32, 40, 42, 48	.35	4.00
" 5	36	32, 40	.35	4.00
" 6	32	30, 36, 38, 40, 48	.35	4.00
" 7	32	30, 40	.35	4.00
" 8	32	30, 36, 40	.35	4.00
" 9	30	28, 32	.35	4.00
" 10	24	28, 30, 32, 36	.35	4.00
" 11	24	28, 30	.35	4.00
" 12	24	20, 32	.35	4.00
" 13	22	20, 24, 32	.38	4.40
" 14	20	18, 24	.38	4.40
" 15	20	18, 24	.38	4.40
" 16	18	16, 20	.38	4.40
" 18	18	16, 20	.38	4.40
" 20	16	18	.45	5.20
" 22	16	18	.45	5.20
" 24	16	14, 18	.45	5.20
" 26	16	14	.63	6.20
" 28	14	16	.53	6.20
" 30	14	16	.53	6.50

MACHINE SCREW NUT TAPS



Sizes and threads not listed are special and subject to special prices.

Size of Screw Gauge	Standard No. of Threads	Total Length, inches	Price, Each
No. 2	56	4	\$0.60
" 3	48	4	.60
" 4	36	4	.60
" 6	32	5	.60
" 8	32	5	.60
" 10	24	5	.60
" 12	24	6	.65
" 14	20	6	.65

STOVE-BOLT TAPS



These Taps correspond in sizes and threads to Standard Stove Bolts.

Sizes and threads not listed will be charged at special prices.
Less than six Taps of a size will be charged at single list.
Price is lower in dozen lots.

Diameter, inches	Number of Threads to inch	PRICE	
		Each	Per Dozen
3/8	28	\$0.35	\$4.00
1/2	24	.35	4.00
5/8	22	.35	4.00
3/4	18	.38	4.40
7/8	18	.38	4.40
1	16	.45	5.20

PIPE TAPS, HOBS AND REAMERS



Reamer



Hob



Tap

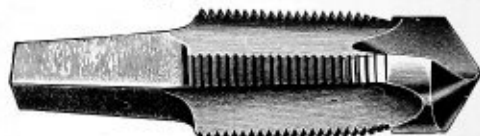
All Pipe Taps are sent with right-hand thread, unless left-hand is specified in order.
Straight (Plug) Pipe Taps same list prices.

Diameter	Price	Diameter	Price	Diameter	Price
1/8 inch	\$1.12	1 inch	\$3.12	2 1/2 inch	\$10.50
1/4 "	1.25	1 1/4 "	3.75	3 "	15.00
3/8 "	1.50	1 1/2 "	4.62	3 1/2 "	22.00
1/2 "	1.87	2 "	6.25	4 "	35.00
3/4 "	2.50				

We also carry in stock an extra high grade pipe tap which takes the same list as above. See discount sheet.

COMBINED PIPE TAP AND DRILL

For Tapping Gas and Water Pipes



Shanks for sizes 3/4 to 1 1/2 inches are 1 1/8 inch by 1/2 inch and 1 3/4 inches long.
Shanks for sizes 2 and 2 1/2 inches are 1 inch by 3/4 inch and 2 inches long.

Size, inch	Length, inches	Price Each	Size, inches	Length, inches	Price Each
1/4	3 3/4	\$1.50	1 1/4	5	\$4.80
3/8	4	1.75	1 1/2	5 1/2	5.80
1/2	4 1/4	2.20	2	5 3/4	7.00
3/4	4 1/2	3.00	2 1/2	6 1/2	10.00
1	4 3/4	3.80			

BIT BRACE TAPS

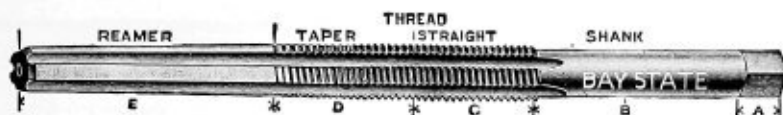


Rough iron sizes, also U. S. or V Standard threads furnished at regular prices.

Diameter, inches	Number of Threads to inch	Price Each
1/8	24	\$0.50
1/4	20	.50
3/8	18	.55
1/2	16	.60
5/8	14	.70
3/4	12, 13	.80

See note following list on Machine Hand Taps.

STAY-BOLT TAPS



When ordering give diameter at largest part, number of threads to inch, state whether V or U. S. form of thread and length over all. For taps of special specifications, give all measurements as indicated by letters on above cut. Blank order forms sent upon request.

Solid bolt dies are used for threading stay-bolts.

Diameter, inches	WHOLE LENGTH—PRICE EACH											
	16 inch	18 inch	21 inch	24 inch	27 inch	30 inch	33 inch	36 inch	39 inch	42 inch	48 inch	54 inch
$\frac{1}{4}$, $\frac{3}{8}$, $\frac{7}{8}$	\$ 6.40	\$ 7.20	\$ 8.40	\$ 9.60	\$10.80	\$12.00	\$13.20	\$14.40	\$15.60	\$16.80	\$19.20	\$21.60
$\frac{1}{2}$, 1	7.20	8.10	9.45	10.80	12.15	13.50	14.85	16.20	17.55	20.90	23.60	24.30
$1\frac{1}{8}$, $1\frac{1}{4}$	8.00	9.00	10.50	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50	24.00
$1\frac{3}{8}$, $1\frac{1}{2}$	8.80	9.90	11.50	13.15	14.80	16.45	18.10	19.75	21.30	22.95	24.50	26.15
$1\frac{5}{8}$, $1\frac{3}{4}$	9.60	10.80	12.60	14.40	16.20	18.00	19.80	21.60	23.40	25.20	27.00	28.80
$1\frac{7}{8}$, $1\frac{1}{2}$	11.20	12.60	14.70	16.80	18.90	21.00	23.10	25.20	27.30	29.40	31.50	33.60

SPINDLE STAY-BOLT TAPS



For re-tapping stay-bolt holes from inside of locomotive fire boxes, etc. Special sizes and lengths made to order. See note following list on Machinists' Hand Taps.

Diameter of Tap, inches	Length of Fluted Thread, inches	Length of Unfluted Thread, inches	Total Length, inches	Diameter of Spindle, inches	Length of Spindle, inches	Price Each
$\frac{1}{4}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	\$ 8.00
$\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	8.50
$\frac{3}{8}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	9.00
$\frac{7}{8}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	9.50
1	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	10.00
$1\frac{1}{8}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	10.50
$1\frac{1}{4}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	11.00
$1\frac{3}{8}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	11.50
$1\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{5}{8}$	$\frac{1}{8}$	11	12.00

STRAIGHT AND TAPER BOILER TAPS



These Taps will be furnished, if desired, $\frac{1}{2}$ over size up to $1\frac{1}{4}$ inches, at regular prices.

Diameter, inches	No. of Threads to Inch	Length Over All	Price Each	Diameter, inches	No. of Threads to Inch	Length Over All	Price Each
$\frac{1}{2}$	12	$3\frac{1}{2}$	\$1.00	$1\frac{1}{8}$	12	$5\frac{1}{2}$	\$3.40
$\frac{3}{8}$	12	$3\frac{1}{2}$	1.15	$1\frac{1}{4}$	12	$5\frac{3}{4}$	3.70
$\frac{1}{4}$	12	$3\frac{3}{4}$	1.30	$1\frac{3}{8}$	12	$5\frac{3}{4}$	4.00
$\frac{1}{8}$	12	4	1.45	$1\frac{1}{2}$	12	6	4.30
$\frac{1}{4}$	12	$4\frac{1}{4}$	1.60	$1\frac{3}{4}$	12	$6\frac{1}{4}$	4.60
$\frac{3}{8}$	12	$4\frac{1}{2}$	1.80	$1\frac{7}{8}$	12	$6\frac{1}{2}$	4.90
$\frac{1}{2}$	12	$4\frac{3}{4}$	2.10	1 $\frac{5}{8}$	12	$6\frac{3}{4}$	5.10
$\frac{3}{4}$	12	5	2.40	$1\frac{3}{4}$	12	7	5.40
1	12	5	2.80	$1\frac{7}{8}$	12	$7\frac{1}{4}$	5.70
$1\frac{1}{8}$	12	5	3.00	2	12	$7\frac{1}{2}$	6.00
$1\frac{1}{4}$	12	$5\frac{1}{4}$	3.20	....	..	...	....

SHORT PATCH-BOLT TAPS



These Taps are made especially for boiler makers, and are slightly tapered, for the purpose of making the bolt a steam-tight fit.

Rough iron sizes furnished at regular prices.

Diameter, inches	No. of Threads to Inch	Length Over All	Price Each	Diameter, inches	No. of Threads to Inch	Length Over All	Price Each
$\frac{1}{2}$	12	$3\frac{1}{4}$	\$0.70	$\frac{1}{8}$	12	$3\frac{1}{2}$	\$1.80
$\frac{3}{8}$	12	$3\frac{1}{4}$	.80	1	12	$3\frac{1}{2}$	2.00
$\frac{1}{4}$	12	$3\frac{1}{2}$	.90	$1\frac{1}{8}$	12	$3\frac{1}{2}$	2.15
$\frac{3}{8}$	12	$3\frac{1}{2}$	1.05	$1\frac{1}{4}$	12	$3\frac{1}{2}$	2.25
$\frac{1}{2}$	12	$3\frac{1}{2}$	1.20	$1\frac{3}{8}$	12	$3\frac{1}{2}$	2.45
$\frac{3}{4}$	12	$3\frac{1}{2}$	1.40	$1\frac{1}{2}$	12	$3\frac{1}{2}$	2.60
$\frac{1}{2}$	12	$3\frac{1}{2}$	1.60	....	..	...	....

HOB OR MASTER TAPS

For Cutting Solid Bolt Dies



Sizes and threads not listed are special and subject to special prices. See note following list on Machinists' Hand Taps.

Diameter, inches	NUMBER OF THREADS TO INCH		V Threads Also Furnished	Whitworth Std.	Price Each
	U. S. Std., Regular	V Std., Regular			
1/4	20	20	.....	20	\$0.75
5/16	18	18	.....	18	.87
3/8	16	16	.....	16	1.00
7/16	14	14	.....	14	1.12
1/2	12, 13	12	.....	13, 14	1.25
5/8	12	12	.....	12	1.44
3/4	11	11	.....	10, 12	1.62
7/8	11	11	.....	12	1.81
1	10	10	.....	10	2.00
1 1/8	10	10	.....	10	2.25
1 1/4	9	9	.....	9	2.62
1 1/2	9	9	.....	9	3.00
1 3/4	8	8	.....	8	3.50
1 7/8	7	7	.....	8	4.00
2	7	7	.....	7	4.62
2 1/4	6	6	.....	6	5.25
2 1/2	6	6	.....	6	5.87
2 3/4	5 1/2	5	.....	5	6.62
3	5	5	.....	5	7.50
3 1/4	5	4 1/2	.....	4 1/2	8.50
3 1/2	4 1/2	4 1/2	.....	4 1/2	9.62

SHORT HOB TAPS



For cutting open and Screw Plate Dies. When wanted for Screw Plates it should be so stated, as they are made larger for this purpose.

Diameter, inches	NUMBER OF THREADS TO INCH		V Threads Also Furnished	Whitworth Std.	Price Each
	U. S. Std.	V Std.			
1/4	20	20	.....	20	\$0.60
5/16	18	18	.....	18	.70
3/8	16	16	.....	16	.80
7/16	14	14	.....	14	.90
1/2	12, 13	12	.....	13, 14	1.00
5/8	12	12	.....	12	1.15
3/4	11	11	.....	10, 12	1.30
7/8	11	11	.....	12	1.45
1	10	10	.....	10	1.60
1 1/8	10	10	.....	10	1.80
1 1/4	9	9	.....	9	2.10
1 1/2	9	9	.....	9	2.40
1 3/4	8	8	.....	8	2.80
2	7	7	.....	8	3.20
2 1/4	7	7	.....	7	3.70
2 1/2	6	6	.....	6	4.20
2 3/4	6	6	.....	6	4.70
3	5 1/2	5	.....	5	5.30
3 1/4	5	5	.....	5	6.00
3 1/2	5	4 1/2	.....	4 1/2	6.80
3 3/4	4 1/2	4 1/2	.....	4 1/2	7.70

SELLER'S HOB TAPS



All sizes, lengths and threads not listed are special and subject to special price. See note following list on Machinists' Hand Taps.

Diameter, inches	Length Over All, inches	NUMBER OF THREADS TO INCH			Price Each
		U. S. Standard	V Standard	Whitworth Standard	
1/4	4 1/2	20	20	20	\$0.91
5/16	4 1/2	18	18	18	1.05
3/8	5	16	16	16	1.20
7/16	5 1/2	14	14	14	1.35
1/2	5 1/2	12, 13	12, 13	12	1.60
5/8	6 1/2	12	12	12	1.75
3/4	7 1/2	11	11	11	1.95
7/8	7	11	11	11	2.20
1	8	10	10	10	2.40
1 1/8	8 1/2	9	9	9	2.70
1 1/4	9	9	9	9	3.15
1 1/2	9 1/2	8	8	8	3.60
1 3/4	10	8	8	8	4.20
2	10 1/2	7	7	7	5.55
2 1/4	11	6	6	6	6.30
2 1/2	11 1/2	5 1/2	5	5	7.50
2 3/4	12	5	5	5	9.00
3	12 1/2	5	4 1/2	4 1/2	10.20
3 1/4	13	4 1/2	4 1/2	4 1/2	11.55

TAPS FOR BEAMAN & SMITH'S HOLDERS



Used in Beaman & Smith Patent Safety Drill and Tap Holders. Prices of taps for holders Nos. 2 1/2 and 3 on application. Sizes and threads not listed are special and subject to special prices.

No. 1 HOLDER					No. 2 HOLDER				
Dia. Inch.	NUMBER OF THREADS TO INCH			Price Each	Dia. Inch.	NUMBER OF THREADS TO INCH			Price Each
	V Stand-	U. S. Stand-	U. S. Also Furnishd			V Stand-	U. S. Stand-	U. S. Also Furnishd	
5/8	20	20	28	\$0.45	5/8	11	11	18	\$0.90
3/4	18	18	24	.50	3/4	11	11	16	1.05
7/8	16	16	24	.55	7/8	10	10	16	1.20
1	14	14	20	.60	1	10	10	14	1.40
1 1/8	12, 13	13	12, 20	.70	1 1/8	9	9	14	1.60
1 1/4	12	12	18	.80	1 1/4	8	8	14	1.80
1 1/2	11	11	18	.90	1 1/2	7	7	14	2.00
					1 3/4	7	7	14	2.25
					2	7	7	14	2.60

BLACKSMITHS' TAPER TAPS

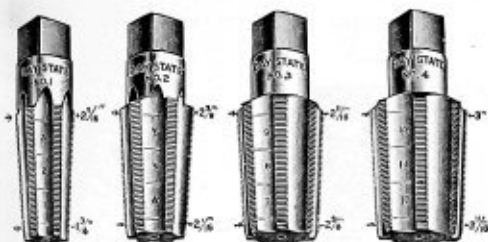


Furnished with left hand threads at regular prices.

Diameter, inches	Number of Threads to Inch	Price Each	Diameter, inches	Number of Threads to Inch	Price Each
1/4	18, 20, 24	\$0.30	3/4	10, 12	\$0.60
5/16	16, 18, 20	.30	7/8	9, 10	1.25
3/8	14, 16, 18	.35	1	8	1.50
7/16	14, 16, 18	.40	1 1/4	7, 8	1.75
1/2	12, 13, 14, 16	.40	1 1/2	7, 8	2.00
5/8	12, 14	.50		6	
3/4	10, 11, 12	.50			

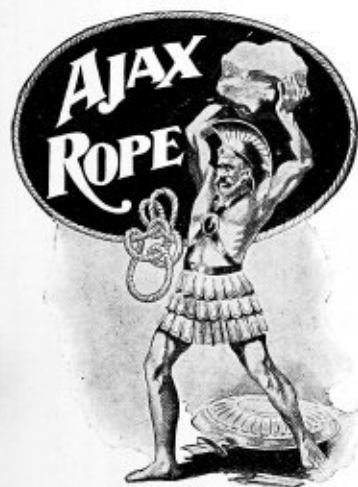
See note following list on Machinists' Hand Taps.

MUD OR WASH-OUT TAPS



Used for tapping wash-out holes in locomotives. Four taps in a set, 6 1/2 inches long, 1/4-inch taper in 12 inches. Each has same size square shank. Marked as shown in cut and corresponds to taper tap of same number.

Number	Bottom, Diameter	Top, Diameter	For Tap Plug, Number	Price Each
1	1 3/4	2 1/4	1-2-3	\$ 6.00
2	2 1/8	2 3/8	4-5-6	7.50
3	2 3/8	2 1/2	7-8-9	9.00
4	2 1/2	3	10-11-12	10.50



Every buyer of Manila rope who wants a high grade, dependable rope—and wants to be sure that he gets it—should specify

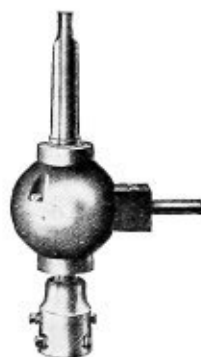
AJAX

(See Index)

ST. LOUIS REVERSING TAPPING MACHINE

The simplest and strongest tool possible for use in drill press or lathe. Feeds in the ordinary manner; may be thrown out of gear when tap reaches required depth by setting stop collar on drill spindle 1/4-inch higher than depth of hole when tap is resting on surface of work.

List prices include any size Morse Taper, Mandrel and Horton or Skinner tap-holding chuck. Fitted ready for use.



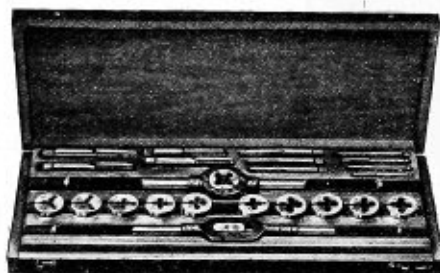
No.	Capacity	Price Each
1	up to and including 3/8-inch	\$18.00
2	up to and including 1/2-inch	21.00
3	up to and including 5/8-inch	24.00
4	up to and including 3/4-inch	30.00

TAPPING MACHINES



Number	Will Tap	Price Each
1	To 1/4-inch	\$ 7.50
2	To 1/2-inch	15.00

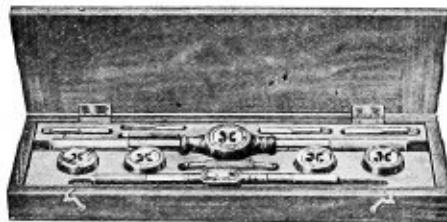
BAY STATE SCREW PLATES



No.	Cutting Sizes	Diam. Dies, inches	Diam. Guides, inches	Length of Stocks, inches	No. of Tap Wrench	Price
25A	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	\$ 4.40
25B	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	4.80
25C	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	4.40
25D	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	3.50
25E	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	3.90
25F	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	5.75
25G	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.20
25H	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.75
25I	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.25
25J	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.00
25K	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.20
25L	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.30
25M	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	11.75
25N	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	12.75
25O	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	13.35
25P	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	14.35
25Q	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	9.50
25R	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	10.50
25S	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	11.50
25T	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	12.50
25U	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.25
25V	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.25
25W	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.45
25X	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.45
25Y	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	12.20
25Z	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	13.45
25AA	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	15.00
25AB	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	16.25
25AC	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.00
25AD	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.25
25AE	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	9.50
25AF	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	14.25
25AG	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	15.50
25AH	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	17.00
25AI	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	18.25
25AJ	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	20.25
25AK	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	12.00
25AL	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	13.25
25AM	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.75
25AN	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.00
25AO	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.25
25AP	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	9.50
25AQ	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	6.25
25AR	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.50
25AS	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	7.75
25AT	4-36, 6-32, 8-32, 10-24, 12-24, 14-20	5/8	1	5	10	8.75

We will substitute where practicable any regularly listed sizes or pitches for those listed in above sets if desired.

BAY STATE SCREW PLATES—(Continued)



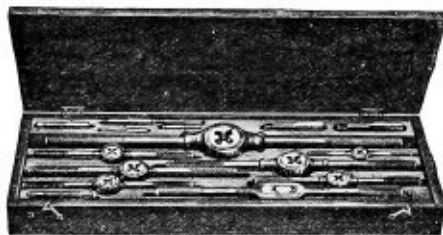
Sets containing Dies in collets with Guides, Taps and adjustable Tap Wrenches. Stocks and Tap Wrenches drop forged from bar steel, and sizes which would be heavy with solid handles have handles of steel tubing.

Set Nos.	Cutting Sizes	Diameter of Dies	Diameter of Collets	Length of Stocks	No. of Tap Wrench	Prices
69A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	16	15	\$12.00
70A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 23	16	19.00
70B	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	23	16	18.50
70C	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 23	16	16.50
70D	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	23	16	16.00
70E	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 23	16	14.00
70F	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	23	16	13.50
80A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 29	15, 17	28.50
80C	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 29	15, 17	26.00
80E	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	16, 29	17	22.50
80G	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	29	17	17.50
80H	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	29	17	15.00
90A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16, 29, 40	16, 18	60.00
90B	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16, 29, 40	15, 17½	47.50
90C	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	40	18	45.00
90D	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{2}$, $1\frac{3}{4}$	29, 40	17½	35.00
90E	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	40	18	32.00
90F	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	40	18	27.50

Screw drivers to fit adjusting screws in dies furnished with each of the above sets.

BAY STATE FULL MOUNTED SCREW PLATES

Sets containing Stock, Guide and Die for each size, and Adjustable Tap Wrenches.

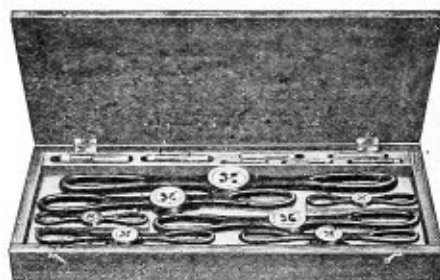


Set Nos.	Cutting Sizes	No. of Tap Wrench	Prices
71A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16	\$20.50
71C	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16	18.00
71E	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16	15.50
81A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	15, 17	32.00
81C	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	15, 17	29.50
81G	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	17	19.50
91A	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	16, 18	67.00
91B	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	15, 17½	47.00
91D	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	17½	40.00
91F	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{4}$, $1\frac{1}{2}$	18	43.50

"V" threads, oversize, will be furnished unless otherwise ordered.

"V" threads, exact sizes, U. S. S., A. L. A. M. or Whitworth threads furnished at same price.

We will substitute where practicable any regularly listed sizes or pitches for those listed in above sets if desired.



BULL DOG, FULL MOUNTED SCREW PLATES

A stock for each Die. The stocks are of simple construction arranged for easy removal of the dies, at the same time insuring perfect alignment. The guides can be removed in an instant when it is desirable to cut a thread close to the head. Bushings can be removed instantly to cut close to shoulder. Handles are made so that each one may be hung up when not in use, or kept in case, as desired.

MACHINISTS' PLATES

No.	Cutting Capacity—Fractional Sizes										Price Each
16A.	$\frac{1}{4}$ - 20,	$\frac{3}{16}$ - 18,	$\frac{1}{2}$ - 16,	$\frac{5}{16}$ - 14,	$\frac{1}{2}$ - 12						\$12.00
18A.	$\frac{1}{4}$ - 20,	$\frac{3}{8}$ - 16,	$\frac{1}{2}$ - 12,	$\frac{5}{8}$ - 11,	$\frac{3}{4}$ - 10						15.50
20A.	$\frac{1}{4}$ - 20,	$\frac{3}{8}$ - 18,	$\frac{1}{2}$ - 16,	$\frac{5}{8}$ - 14,	$\frac{1}{2}$ - 12,	$\frac{3}{4}$ - 11,	$\frac{3}{4}$ - 10				18.00
22A.	$\frac{3}{8}$ - 16,	$\frac{1}{2}$ - 14,	$\frac{1}{2}$ - 12,	$\frac{5}{8}$ - 11,	$\frac{3}{4}$ - 10,	$\frac{3}{8}$ - 9,	1 - 8				24.00
24A.	$\frac{1}{4}$ - 20,	$\frac{3}{8}$ - 18,	$\frac{1}{2}$ - 16,	$\frac{5}{8}$ - 14,	$\frac{1}{2}$ - 12,	$\frac{3}{8}$ - 11,	$\frac{3}{4}$ - 10,	$\frac{3}{8}$ - 9,	1 - 8		29.50

AUTOMOBILE PLATES

These sets are furnished with form of thread, pitches, etc., as adopted by the Association of Licensed Automobile Manufacturers.

No.	Cutting Capacity—Fractional Sizes										Price Each
30.	$\frac{1}{4}$ - 28,	$\frac{3}{16}$ - 24,	$\frac{1}{2}$ - 21,	$\frac{5}{16}$ - 20,	$\frac{1}{2}$ - 20						\$12.00
32.	$\frac{1}{4}$ - 28,	$\frac{3}{8}$ - 24,	$\frac{1}{2}$ - 20,	$\frac{5}{8}$ - 18,	$\frac{3}{4}$ - 16						15.50
34.	$\frac{1}{4}$ - 28,	$\frac{3}{8}$ - 24,	$\frac{1}{2}$ - 20,	$\frac{5}{8}$ - 20,	$\frac{1}{2}$ - 20,	$\frac{3}{4}$ - 18,	$\frac{3}{4}$ - 16				18.00
36.	$\frac{3}{8}$ - 24,	$\frac{1}{2}$ - 20,	$\frac{1}{2}$ - 20,	$\frac{5}{8}$ - 18,	$\frac{3}{4}$ - 16,	$\frac{3}{8}$ - 14,	1 - 14				24.00
38.	$\frac{1}{4}$ - 28,	$\frac{3}{8}$ - 24,	$\frac{1}{2}$ - 20,	$\frac{5}{8}$ - 18,	$\frac{3}{4}$ - 16,	$\frac{3}{8}$ - 14,	1 - 14				29.50

For extra parts see Index.

Always state style of thread wanted when ordering.

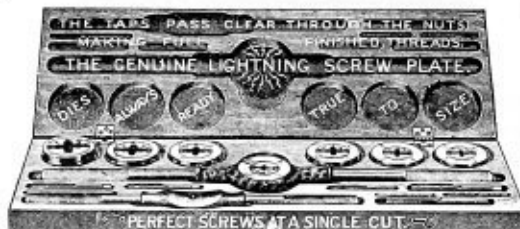
See note following machinists' hand taps.

Exact sizes always furnished unless otherwise specified.

LIGHTNING SCREW PLATES

It finishes the work at one cut, making a screw equal to the best lathe work, no burr being raised above the true size. Nuts and bolts threaded with it need not be matched and kept together; they always correspond.

The dies, having all the strength and reliability of solid dies, are **not solid**, but are adjustable for wear, so as to keep the exact size of the taps, notwithstanding long use, and to allow nuts and bolts for different purposes to be made to fit together tightly or loosely, as may be desired. When used up they can be replaced, the stock, collets, etc., remaining good.



Catalog No.	Sizes, inches	Set contains Taps, Dies and Collets, sizes, inches	Diameter of Collets, inches	No. of Tap Wrenches	Length of Stock, inches	PRICE PER SET	
						Without T. Wrench	With Tap Wrench
192	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	$\frac{3}{16}$	53	23	\$16.00	\$18.75
194	$\frac{1}{2}$ to 1	$\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, 1	$\frac{3}{16}$	54	29	18.50	22.00
198	$\frac{1}{4}$ to 1	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1	$\frac{3}{16}$	52-54	29	25.50	31.15
200	$\frac{3}{8}$ to $1\frac{1}{2}$	$\frac{3}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$	$\frac{1}{2}$	56	53	45.00	51.00

Always specify thread wanted. Other sets than the above can be furnished at proportionate prices. For extra parts, see index. **Always state whether V-thread oversize or exact or U. S. Standard thread is wanted.**

LITTLE GIANT SCREW PLATES

Dies are always in perfect alignment. Perfect threads at a single cut. Nuts or bolts, when cut, do not have to be matched. Tight or loose fits can be made as desired by adjusting die to size.

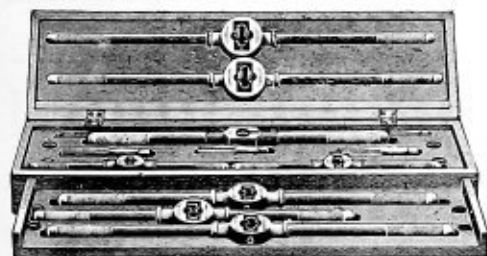


Sectional View of Die
and Collet

Set No.	Cutting Capacity—Fractional Sizes	Has Stock Length, Inches	Has Collets Diameter, Inches	Price Each		
1	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12	14½	2	\$12.00		
2	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -12, $\frac{7}{16}$ -11, $\frac{1}{2}$ -10	23	2½	13.50		
3	$\frac{1}{4}$ -11, $\frac{3}{8}$ -10, $\frac{1}{2}$ -9, 1-8	26	2½	15.00		
4	$\frac{3}{8}$ -12, $\frac{1}{2}$ -11, $\frac{3}{4}$ -10, 1-9, 1-8	26	2½	17.50		
5	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10	23	2½	16.00		
5½	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -12, $\frac{1}{2}$ -11, $\frac{1}{2}$ -10	23	2½	18.50		
6	$\frac{1}{4}$ -16, $\frac{5}{16}$ -14, $\frac{3}{8}$ -12, $\frac{7}{16}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8	26	2½	22.00		
7	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8	26	2½	25.50		
8	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10	14½	2	18.00		
9	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8	14½	2	27.50		
20	$\frac{5}{16}$ -11, $\frac{3}{8}$ -10, $\frac{1}{2}$ -9, 1-8, 1½-7, 1½-7	40	4	35.00		
25	$\frac{3}{8}$ -9, 1-8, 1½-7, 1½-7, 1¾-6, 1½-6	52	4½	45.00		
30	1½-7, 1½-7, 1¾-6, 1½-6	52	4½	37.50		
40	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8, 1½-7, 1½-7	23	40	4	40.00	
50	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8, 1½-7, 1½-7, 1¾-6, 1½-6	26	52	2½	4½	60.00

Each assortment has adjustable tap wrench for holding all sizes of taps contained in the assortment. For extra parts see page . In ordering always state style of thread wanted, "V" or U. S. Standard.

"V" Thread Oversizes furnished unless otherwise ordered.

LITTLE GIANT FULL MOUNTED
SCREW PLATES

Has a stock for every die. Each set complete with adjustable tap wrench, stocks, dies and taps put up in neatly finished wooden case. Handles of stocks are knurled.

No. of Set	Cutting Capacity—Fractional Sizes	Has Tap Wrenches		Price Each
		No.	No.	
61	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12	5	.....	\$12.00
62	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -12, $\frac{7}{16}$ -11, $\frac{1}{2}$ -10	6	.....	15.50
65	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10	6	.....	18.00
65 $\frac{1}{2}$	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -12, $\frac{1}{2}$ -11, $\frac{1}{2}$ -10	6	.....	20.50
66	$\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8	7	.....	24.00
67	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8	5	7	29.50
640	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8, 1 $\frac{1}{4}$ -7, 1 $\frac{1}{2}$ -7	6	7 $\frac{1}{2}$	47.00
650	$\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{3}{4}$ -11, $\frac{1}{2}$ -10, 1-9, 1-8, 1 $\frac{1}{4}$ -7, 1 $\frac{1}{2}$ -7, 1 $\frac{3}{4}$ -6, 1 $\frac{1}{2}$ -6	6	8	67.00

For extra parts see page 429.

"V" Thread Oversizes furnished unless otherwise ordered.

GREEN RIVER SCREW PLATES

For Threading Bolts and Nuts by Hand Power

We list below the sets of these Screw Plates, the demand for which has proven them to be the most popular; others, including sets of almost any scope from 1/8-inch to 1 1/2-inch can be furnished at proportionate prices.



	Set Number	Size, inches	Set Contains Taps, Dies and Guides, Sizes, inches	Diameter of Dies, inches	Length of Stock, inches	Price Each
	101	1 1/4	1/8 to 1/2	1/8, 1/4, 5/8, 3/4, 7/8, 1	2 3/8 18	\$11.00
*	1102	1 1/4	1/8 to 1/2	1/8, 1/4, 5/8, 3/4, 7/8, 1	2 3/8 18	12.00
	123	1 3/4	1/4 to 3/4	3/4, 5/8, 1/2, 3/8, 1/4	2 3/8 22	10.25
*	1124	1 3/4	1/4 to 3/4	3/4, 5/8, 1/2, 3/8, 1/4	2 3/8 22	11.25
*	1106	2	1/4 to 3/4	1/4, 5/8, 3/8, 1/2, 1/4	2 3/4 23	15.25
	107	3	1/2 to 1	1/2, 3/8, 3/4, 7/8, 1	2 3/4 29	15.75
*	1108	3	1/2 to 1	1/2, 3/8, 3/4, 7/8, 1	2 3/4 29	16.75
	111	5	1/4 to 1	3/4, 5/8, 3/8, 1/2, 1/4	2 3/4 29	23.00
	1112	5	1/4 to 1	3/4, 5/8, 3/8, 1/2, 1/4	2 3/4 29	24.00
	113	6	1/2 to 1 1/4	1/2, 3/8, 3/4, 7/8, 1	2 3/4 35	26.00
	115	8	1/4 to 1 1/4	3/4, 5/8, 3/8, 1/2, 1/4	2 3/4 35	34.00
	116	9	3/8 to 1 1/2	7/8, 1, 1 1/8, 1 1/4, 1 3/8	3 1/8 53	4.00
	120	25	1/4 to 1 1/2	1/4, 5/8, 3/8, 1/2, 1/4	3 1/8 53	53.00

* Set also contains one adjustable Tap Wrench.

For Tap Wrenches see index.

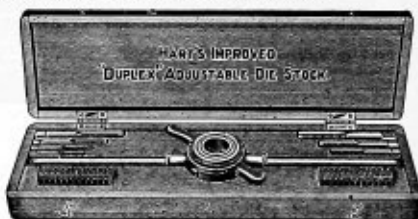
For Extra Parts for Green River Screw Plates, see index.

Oversizes furnished unless otherwise ordered.

HART'S PATENT DUPLEX DIE STOCKS

For Bolts and Rods

The quick-opening feature of the dies in these tools is especially valuable, as there is great saving of time by releasing them from finished work without being obliged to turn back over the long threads on bolts. The ease with which the size of threads may be varied is also a great advantage. The dies can be set immediately to thread standard sizes, or any over or under size; they cut free and easy, and are no more difficult to sharpen than a chisel.



MACHINISTS' SETS

Set No.	Cutting Sizes	No. of Dies	No. of Taps	Price Each	Extra Dies Per Set 4 Pieces
AA	1/8-24, 1/4-20, 5/8-18, 3/4-16, 1 1/4-14, 1 1/2-12	6	6	\$15.00	\$1.00
A	1/4-20, 5/8-18, 3/4-16, 1 1/4-14, 1 1/2-12, 5/8-11, 3/4-10	7	7	20.00	1.25
B	1/4-20, 5/8-18, 3/4-16, 1 1/4-14, 1 1/2-12, 5/8-11, 3/4-10, 7/8-9, 1-8	9	9	30.00	1.50

AUTOMOBILE SETS

Set No.	Cutting Sizes	No. of Dies	No. of Taps	Price Each	Extra Dies Per Set 4 Pieces
A10	1/4-28, 5/8 & 3/8-24, 1 1/8 & 1/2-20, 1 1/4 & 3/8-18, 1 1/2 & 3/4-16	5	9	\$24.00	\$1.25
B10	1/4-28, 5/8 & 3/8-24, 1 1/8 & 1/2-20, 1 1/4 & 3/8-18, 1 1/2 & 3/4-16, 7/8 & 1-14	6	11	32.50	1.50
BB	1/2-12, 5/8-11, 3/4-10, 7/8-9, 1-8, 1 1/8-7, 1 1/4-7	6	7	37.00	1.75
†BB2	1/4-20, 5/8-18, 3/4-16, 1 1/4-14, 1 1/2-12, 5/8-11, 3/4-10, 7/8-9, 1-8, 1 1/8-7, 1 1/4-7	6	7	48.00	.....

* Sets with U. S. S. thread are furnished 1/2-13 thread.

Above prices include sets complete in case.

† This is a Combination Set, containing a size A and a size BB Die Stock, complete with Taps.

For Taps, see index.

No. 221
3/8 Inch Diam.No. 222
1/2 Inch Diam.

ADJUSTABLE ROUND SPLIT DIES

All sizes and threads not listed are special, prices on application. Stocks holding these dies are listed elsewhere. Dies 224A 1/4 inch or 3/8 inch oversize, up to and including 5/8 inch and 3/2 inch oversize in larger diameters, same list and discount as even sizes.



No. 224 A

List Prices Round Split Dies

Cutting, Size inches	NUMBER OF THREADS TO INCH			PRICE EACH		
	V Standard	United States Standard	V Threads Also Furnished	5/8-Inch Diameter	1/2-Inch Diameter	1-Inch Diameter
1			56, 60, 64, 72	\$0.40	\$0.40	
1 1/2			56	.40	.40	
2	56		48, 64	.40	.40	
3	48		40, 56	.40	.40	
4	36		32, 40, 42, 48	.40	.40	\$0.75
5	36		32, 40	.40	.40	.75
6	32		30, 36, 38, 40, 48	.40	.40	.75
7	32		30, 40	.40	.40	.75
8	32		30, 36, 40	.40	.40	.75
9	30		28, 32	.40	.40	.75
10	24		28, 30, 32, 36	.40	.40	.75
11			24, 28, 30	.40	.40	.75
12	24		20, 32	.40	.40	.75
13			20, 22, 24, 32	.40	.40	.75
14	20		18, 24	.40	.40	.75
15			18, 20, 24	.40	.40	.75
16	18		16, 20		.40	.75
18	18		16, 20			.75
20	16		18			.75
22	16		18			.75
24	16		14, 18			.75
1/8	72	64	60, 64	.40	.40	
3/16	72		56, 60, 64	.40	.40	
1/4	56	50	48, 50, 54, 60	.40	.40	
5/16	56		48	.40	.40	
3/8	40	40	32, 36, 48, 50	.40	.40	.75
7/16	40		32, 36	.40	.40	.75
1/2	32	36	30, 36, 40	.40	.40	.75
5/8	32		36	.40	.40	.75
3/4	24	32	30, 32, 36	* .40	* .40	.75
7/8	24	32	32	* .40	* .40	.75
1	24	28	32	.40	.40	.75
1 1/8	24		32	.40	.40	.75
1 1/4	20	20	24, 27, 32	.40	.40	.75
1 1/2	20	20	24, 27, 32	.40	.40	.75
1 3/4	20	20	24, 27, 32		.40	.75
2	18	18	20, 24, 27, 32		.40	.75
2 1/8	18	18	20, 24, 27, 32			.75
2 1/4	18	18	20, 24, 27, 32			.75
2 3/8	16	16	14, 18, 20, 24, 27			.75
2 1/2	16	16	14, 18, 20, 24, 27			.75
2 3/4	16	16	14, 18, 20, 24, 27			.75
3	14	14	12, 16, 20, 24, 27			.75
3 1/8	14		12, 16			.75
3 1/4	12		13, 14, 16, 20, 24, 27			.75
3 3/8	12		13, 14, 16			.75

* We also furnish 1/8 and 1/4 inch dies at regular list and discount with 24 threads to the inch, United States Standard form, and 3/8 inch dies with 32 threads to the inch, Whitworth Standard form.

LIST PRICES ROUND SPLIT DIES—(Continued)

CUTTING SIZES		NUMBER OF THREADS TO INCH			PRICE EACH			
Standard	Rough Iron	United States Standard	V Standard	V Threads Also Furnished	1½ inch Diameter	1½ inch Diameter	1¾ inch. Diameter	2 inch. Diameter
3		32	24	30, 32, 36	*1.00			
3½		32	24	32	*1.00			
4		28	24	32	1.00			
4½		24	24	32	1.00			
5		20	20	24, 27, 32	1.00	1.00	1.25	1.50
5½		20	20	24, 27, 32	1.00	1.00	1.25	1.50
6		20	20	24, 27, 32	1.00	1.00	1.25	1.50
6½		18	18	20, 24, 27, 32	1.00	1.00	1.25	1.50
7		18	18	20, 24, 27, 32	1.00	1.00	1.25	1.50
7½		18	18	20, 24, 27, 32	1.00	1.00	1.25	1.50
8		16	16	14, 18, 20, 24, 27	1.00	1.00	1.25	1.50
8½		16	16	14, 18, 20, 24, 27	1.00	1.00	1.25	1.50
9		16	16	14, 18, 20, 24, 27	1.00	1.00	1.25	1.50
9½		14	14	12, 16, 20, 24, 27	1.00	1.00	1.25	1.50
10		14	14	12, 16, 20, 24, 27	1.00	1.00	1.25	1.50
10½		14	14	12, 16, 20, 24, 27	1.00	1.00	1.25	1.50
11		13	12	13, 14, 16, 20, 24, 27	†1.00	†1.00	†1.25	†1.50
11½		13	12	13, 14, 16, 20, 24, 27	†1.00	†1.00	†1.25	†1.50
12		13	12	13, 14, 16, 20, 24, 27	†1.00	†1.00	†1.25	†1.50
12½		12	12	14, 27		1.00	1.50	1.75
13		12	12	14, 27		1.00	1.50	1.75
13½		11	11	10, 12, 20, 24, 27		1.00	1.50	1.75
14		11	11	10, 12, 20, 24, 27		1.00	1.50	1.75
14½		11	11	10, 12, 20, 24, 27		1.00	1.50	1.75
15		11	11	10, 12		1.00	1.75	2.00
15½		11	11	10, 12		1.00	1.75	2.00
16		10	10	12, 20, 27		1.00	1.75	2.00
16½		10	10	12, 20, 27			1.75	2.00
17		10	10	12				2.25
17½		10	10	12				2.25
18		9	9	10, 12, 27				2.25
18½		9	9	10, 12, 27				2.25
19		9	9	12				2.50
19½		9	9	12				2.50
20		8	8	12, 27				2.50
20½		8	8	12, 27				2.50

* We also furnish 7/8 and 1½ inch dies at regular list and discount with 24 threads to the inch United States Standard form, and 7/8 dies with 32 threads to the inch, Whitworth Standard form.

† Dies cutting ½ inch in both even and rough iron sizes are furnished with 12 threads to the inch, United States Standard form, at regular list and discount.

BIT-BRACE DIE HOLDERS

For Round Adjustable Split Dies



No. 220 B

No.	Holds Dies	Price Each
1	5/8 inch diameter	\$0.50
2	1 1/8 " "	.50
3	1 " "	.75

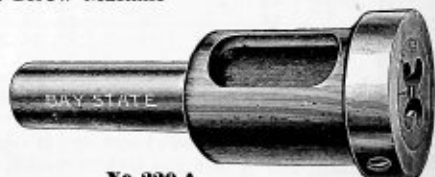
The above prices are for the Holders only.

DIE HOLDERS

For Use in Lathe or Turret of Screw Machine

No.	Diameter of Shank of Holder	Holds Round Adjustable Dies	Price Each
1	1/2 inch	5/8 inch diameter	\$0.50
2	5/8, 3/4, 1 1/8 " "	1 1/8 " "	.50
3	1 1/2, 3/4, 1 1/8 " "	1 " "	.75
4	1 1/2, 3/4, 1 1/8 " "	1 1/8 " "	1.50

Mention size shank desired when ordering.



No. 220 A

EXTRA PARTS FOR BAY STATE SCREW PLATES

SOLID SCREW PLATE STOCKS
Holding Round Solid and Adjustable Dies



No.	Length, inches	Outside Diam. of Die, inches	For Collets	Price Each
..	3½	1	...	\$0.40
..	5	1½	...	.40
..	7	2	...	.50
..	10½	1	...	1.00
..	14	1½	...	1.25
..	18	2	...	1.50
..	23	2½	...	1.75
17	16	1¾	1¾	2.00
18	23	2¼	2¼	2.50
19	29	2¾	2¾	3.00
20	40	3¾	3¾	6.00

GUIDES AND COLLETS

COLLETS FOR SCREW PLATES Nos. 60 to 91				GUIDES FOR PLATES Nos. 27A to 50	
Outside Diam.	For Die	For Stock	Price	Outside Diameter	Price
1¾	1 ⅞	17	\$0.75	1 ⅞	\$0.25
2¼	1¾	18	1.00	1	.30
2¾	2 ⅞	19	1.00	1 ⅞	.40
3¾	3	20	1.50	1½	.50
...	...	...	...	2	.55
...	...	...	...	2½	.60
...	...	...	...	3	.75

BULLDOG SCREW PLATE PARTS

Diam. Die	Stock		Price Guides Each
	Length	Price	
1 ⅞	8¾	\$0.50	\$0.25
1	10¼	.75	.25
1½	15½	1.25	.25
2	20½	1.50	.50
2½	25	2.25	.50

Stocks take standard round adjustable dies listed elsewhere in this catalog.

EXTRA PARTS FOR LIGHTING SCREW PLATES

Sizes	Dies			Taps	Collets	Stocks
	Prices	Outside Diam., In.	Thickness, inches			
¾	\$1.00	1 ⅞	½	\$0.35	\$0.50	\$0.50
¾	1.00	1 ⅞	¾	.45	.50	.50
¾	1.00	1 ⅞	1	.50	.50	.50
¾	1.15	1 ⅞	1½	.55	.50	.55
¾	1.30	1 ⅞	2	.60	.50	.60
¾	1.50	1 ⅞	2½	.70	.50	.70
¾	1.60	1 ⅞	3	.80	.50	.80
¾	1.75	1 ⅞	3½	.90	.50	.85
¾	1.90	2 ⅞	4	1.05	.50	.90
¾	2.00	2 ⅞	4½	1.20	.50	.90
¾	2.25	2 ⅞	5	1.40	.50	1.10
¾	2.50	2 ⅞	5½	1.60	.50	1.10
¾	2.75	2 ⅞	6	1.80	.50	1.25
¾	3.00	2 ⅞	7	2.00	.50	1.25
1	3.50	2 ⅞	1	2.25	1.00	1.75
1½	4.00	2 ⅞	1¼	2.60	1.00	1.75
1¾	4.50	2 ⅞	1½	3.00	1.00	2.50
1¾	5.00	2 ⅞	1½	3.50	1.00	2.50

EXTRA PARTS FOR LITTLE GIANT SCREW PLATES

Stocks			Collets		Dies	
Length inches	For Collets, Diameter	Price Each	Diameter inches	Price Each	Diameter inches	Price Each
7½	1¼	\$0.70	1¼	\$0.40	1	\$1.00
13½	1½	1.25	1½	.50	1¼	1.00
14½	2	1.50	2	.50	1½	1.00
23	2¼	2.00	2¼	.50	1¾	1.25
26	2¾	2.00	4	1.50	2	1.25
29	2¾	2.00	4½	1.50	2½	1.50
40	4	6.00	...	...	3	1.50
52	4½	8.00	...	...	3½	1.75
...	...	...	...	...	4	1.75
...	...	...	...	...	4½	2.00
...	...	...	...	...	5	2.00
...	...	...	...	...	5½	2.75
...	...	...	...	...	6	2.75
...	...	...	...	...	6½	2.75
...	...	...	...	...	7	4.00
...	...	...	...	...	7½	4.00
...	...	...	...	...	8	5.00
...	...	...	...	...	8½	5.00

PARTS FOR FULL MOUNTED PLATES

Diameter, inches	Price Each of Dies	Price of Full Mtd. Stocks Only	Diameter, inches	Price Each of Dies	Price of Full Mtd. Stocks Only
¾	\$1.00	\$0.50	¾	\$2.00	\$0.75
¾	1.00	.50	1	2.00	1.00
¾	1.00	.50	1¼	2.75	1.00
¾	1.25	.50	1½	2.75	1.00
¾	1.25	.75	1¾	2.75	1.00
¾	1.50	.75	2	4.00	1.75
¾	1.50	.75	2½	4.00	1.75
¾	1.75	.75	3	5.00	2.25
1	1.75	.75	3½	5.00	2.25

EXTRA DIES AND GUIDES FOR GREEN RIVER SCREW PLATES

Size, inches	OUTSIDE DIAMETER, INCHES			Taps	*Guides
	2½ Each	3¼ Each	3½ Each		
¾	\$1.25	...	...	\$0.35	\$0.25
¾	1.25	\$1.25	...	.45	.25
¾	1.25	1.25	...	.50	.25
¾	1.50	1.50	...	.55	.25
¾	1.50	1.50	...	.60	.25
¾	1.50	1.50	...	.70	.25
¾	1.60	1.60	...	.80	.25
¾	1.75	1.75	...	.90	.25
¾	1.90	1.90	...	1.05	.25
¾	2.00	2.00	...	1.20	.25
¾	2.25	...	...	1.40	.25
¾	2.50	...	...	1.60	.25
¾	2.75	2.75	...	1.80	.25
1	3.00	3.00	...	2.00	.25
1¼	3.50	3.50	...	2.25	.25
1½	4.00	4.00	...	2.60	.25
1¾	4.50	4.50	...	3.00	.25
1¾	5.00	5.00	...	3.50	.25

When ordering Dies and Guides be sure to state Sizes and Outside Diameter.
Dies and Guides 2½ inch Diameter furnished for sizes ¾ inch to ¾ inch only.
Dies and Guides 3¼ inch Diameter furnished for sizes ¾ inch to 1¼ inch only.
Dies and Guides 3½ inch Diameter furnished for sizes ¾ inch to 1½ inch only.

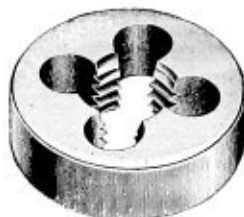
PATENT ELASTIC STOCK

Length, inches	Diameter of Socket, inches	Price Each	Length, inches	Diameter of Socket, inches	Price Each
6	¾	\$0.75	29	2¾	\$2.00
10	1¼	1.50	35	3¼	4.00
18	2	2.00	53	3½	6.00
22	2½	2.00	48	4	7.00
23	2¾	2.00	4 hds	3½	7.00

PIPE AND SOLID BOLT DIES



Machine or Solid Bolt Dies



Round Adjustable Pipe Dies

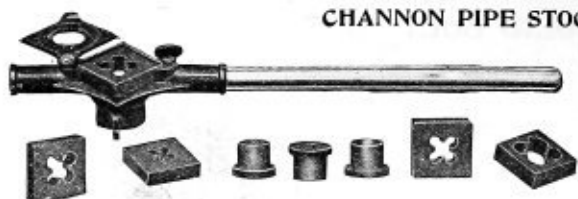
MACHINE OR SOLID BOLT DIES

CUTTING SIZE		NUMBER OF THREADS TO INCH			DIMENSIONS		Price Each	CUTTING SIZE		NUMBER OF THREADS TO INCH			DIMENSIONS		Price Each
Standard	Rough Iron	United States Standard	V Standard	Threads also Furnished	Size of Square	Thickness		Standard	Rough Iron	United States Standard	V Standard	Threads also Furnished	Size of Square	Thickness	
1/4	1 1/2	20	20		2 1/2	1/2	\$1.80	3/8	3 1/2	10	10		2 1/2	3/4	\$2.30
	1 1/2	20	20		2 1/2	1/2	1.80		3 1/2	9	9	10, 12	2 1/2	3/4	2.40
	3/2	20	20		2 1/2	1/2	1.80		3 1/2	9	9	10, 12	2 1/2	3/4	2.40
5/16	2 1/4	18	18	16	2 1/2	1/2	1.80	1/2	3 1/2	9	9	12	2 1/2	3/4	2.55
	3/2	18	18	16	2 1/2	1/2	1.80		3 1/2	9	9	12	2 1/2	3/4	2.55
	3/2	18	18	16	2 1/2	1/2	1.80		3 1/2	8	8	12	2 1/2	1	2.70
3/8	2 3/4	16	16	14	2 1/2	1/2	1.80	1	1 3/2	8	8	12	2 1/2	1	2.70
	3/2	16	16	14	2 1/2	1/2	1.80	1 1/8	1 3/2	8	8	12	2 1/2	1	2.85
	3/2	16	16	14	2 1/2	1/2	1.80	1 1/8	1 3/2	7	7	12	2 1/2	1	3.00
7/16	3 1/4	14	14	12	2 1/2	1/2	1.80		1 3/2	7	7	12	2 1/2	1	3.00
	3/2	14	14	12	2 1/2	1/2	1.80		1 3/2	7	7	12	2 1/2	1	3.15
	3/2	14	14	12	2 1/2	1/2	1.80	1 1/4	1 3/2	7	7	12	2 1/2	1	3.30
1/2	3 3/4	*13	12	13	2 1/2	3/4	1.80		1 3/2	7	7	12	2 1/2	1	3.30
	3/2	*13	12	13	2 1/2	3/4	1.80	1 1/8	1 3/2	7	7	12	2 1/2	1	3.45
	3/2	*13	12	13	2 1/2	3/4	1.80	1 3/8	1 3/2	6	6	12	2 1/2	1	3.60
5/8	4 1/4	12	12	13	2 1/2	3/4	1.90		1 3/2	6	6	12	2 1/2	1	3.60
	3/2	12	12		2 1/2	3/4	1.90	1 1/2	1 3/2	6	6	12	2 1/2	1	3.75
	3/2	12	12		2 1/2	3/4	1.90	1 1/2	1 3/2	6	6	12	3	1	3.90
3/4	4 3/4	11	11	10, 12	2 1/2	3/4	2.00		1 3/2	6	6	12	3	1	3.90
	3/2	11	11	10, 12	2 1/2	3/4	2.00	1 3/8	1 3/2	5 1/2	5	12	3	1	4.20
	3/2	11	11	10, 12	2 1/2	3/4	2.00		1 3/2	5 1/2	5	12	3	1	4.20
7/8	5 1/4	11	11		2 1/2	3/4	2.15	1 3/4	1 3/2	5	5	12	3	1 1/4	5.40
	3/2	11	11		2 1/2	3/4	2.15		1 3/2	5	5	12	3	1 1/4	5.40
1	5 3/4	10	10	12	2 1/2	3/4	2.25		1 3/2	5	4 1/2	12	3 1/2	1 1/2	6.50
	3/2	10	10	12	2 1/2	3/4	2.25		1 3/2	5	4 1/2	12	3 1/2	1 1/2	6.50
1 1/8	6 1/4	10	10		2 1/2	3/4	2.30	2	2 3/2	4 1/2	4 1/2	12	3 3/4	2	7.50
	3/2	10	10		2 1/2	3/4	2.30		2 3/2	4 1/2	4 1/2	12	3 3/4	2	7.50

*We also furnish 1/2-inch Machine or Solid Bolt Dies in both even and rough iron sizes at regular list and discount, with 12 threads to the inch, United States Standard form.

ROUND ADJUSTABLE PIPE DIES

Cutting Size	Thread	1" Dia.	1 1/8" Dia.	1 1/4" Dia.	2 1/4" Dia.
		3/8" Thick	3/8" Thick	3/8" Thick	3/8" Thick
1/8	27	\$0.75	\$1.00	\$1.50	\$1.80
1/4	18	.....	1.00	1.50	1.80
3/8	18	.....	1.00	1.50	1.80
1/2	14	.....	.....	1.50	1.80
3/4	14	.....	.....	.....	1.80
1	11 1/2	.....	.....	.....	2.00

CHANNON PIPE STOCKS AND DIES

For Wrought Iron or Steel Pipe


Number	Price Each	Set Contains Dies, Sizes	Size of Dies, inches	SINGLE PARTS. PRICE EACH.				
				Stock	Dies	Bushings	Die Frames	Leader Screw
0	\$ 9.50	1/8, 3/4, 3/8, 1/2.....	2 x 1/2	\$ 3.50	\$1.50	\$0.25	.....	.....
1	15.00	1/4, 3/8, 1/2, 3/4, 1.....	2 1/2 x 3/4	5.00	2.00	.35	\$0.30	.....
1 1/2	13.50	3/4, 1, 1 1/4.....	3 x 3/4	6.00	2.50	.45	.40	.....
1 3/4	13.50	1, 1 1/4, 1 1/2.....	3 x 3/4	6.00	2.50	.45	.40	.....
2	20.00	1 1/4, 1 1/2, 2.....	4 x 3/8	9.50	3.50	.60	.50	\$4.25
3	43.00	2 1/2, 2 3/4, 3.....	5 x 1 1/4	25.00	9.00	1.00	.60	6.50
3 1/2	51.00	2 3/4, 3.....	5 x 1 1/4	33.00	9.00	1.00	.60	6.50
2 Special	35.00	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2.....						

PRICES ON PARTS QUOTED UPON APPLICATION

Our No. 2 Special cuts from 1/8 to 2-inch pipe inclusive, a greater range than can be had in any of the regular sets.

No. 3 1/2 has stock with four arms.

MILLER'S REVERSIBLE RATCHET PIPE DIE PLATE

Figure 421. Number "B"

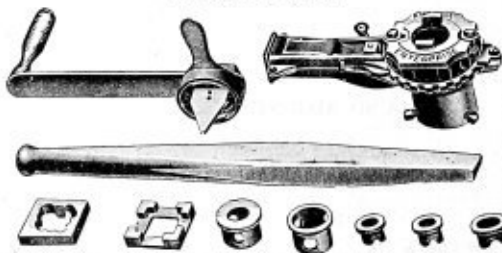
Figure 420. Numbers "C" and "D"

Number	Contains Dies	Size of Dies, inches	PRICE		PRICES OF EXTRA PARTS		
			With Dies	With Stock Only	Dies	Bushings	Die Frames
B	1/4, 3/8, 1/2, 3/4, 1.....	2 1/2 x 3/4	\$15.00	\$ 7.50	\$1.50	\$0.25	\$0.22
C	1, 1 1/4, 1 1/2.....	3 x 3/4	18.50	13.00	1.80	.35	.30
D	1 1/4, 1 1/2, 2.....	4 x 3/8	20.00	12.50	2.50	.45	.38

ENTERPRISE IMPROVED RATCHET DIE STOCK AND PIPE REAMER

For Threading Pipe in Corners and Other Difficult Positions. Suitable for Bench Work as Well as All Outside Work.

Each stock has leader screw sleeve, insuring perfect threads, and chip channels which prevent clogging. Bushings with each stock and die frames with No. 1 & 2. A clearance of only 2 1/4 inches from center of pipe is required to operate.



Reamer is adjustable to ream any size pipe for which stock is adapted. Pipe can be reamed with die in or out of stock, before or after thread is cut, or while die is still on pipe and threads are being cut.

Size	Cutting Capacity	Bushings, inches	Largest Die Will Take	Price Complete Without Dies	PRICES EXTRA DIES			
					For Set	Size	Dies for Pipe	Each
0	1/8 to 3/8	1/8 to 1/2	2 x 2	\$11.00	0	2 x 2	1/8, 1/4, 3/8, 1/2, 3/4.....	\$1.50
1	3/8 to 1 1/2	1/4 to 1 1/4	3 x 3	14.00	1	2 x 2	3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2.....	1.50
2	1/2 to 2	1/2 to 1 1/2	4 x 4	20.00	1	3 x 3	1/2, 3/4, 1, 1 1/4, 1 1/2.....	2.50
					2	4 x 4	1 1/2, 2.....	3.50

OSTER STOCKS AND DIES

Dies are adjustable to a wide range of sizes and to variations from sizes of pipe and fittings. They are opened and retired from the thread by one turn of a thumb screw allowing stock to be removed without backing over the finished thread.

OSTER BULL-DOG DIE STOCK



All parts are exceptionally strong and well made and will stand rough usage. Dies instantly released by lever-setting device, without backing over finished thread. They can also be opened and reset for same size by one movement of lever, or set for any size within their capacity by throwing one locking handle.

Threads Pipe, inches	PLAIN		RATCHET		Extra Dies
	No.	Price	No.	Price	
1/8 to 3/4	101	\$13.00	.....	.....	\$1.50
3/4 to 1 1/4	102	17.00	102R	\$20.00	1.75
1 to 2	103A	22.00	103R	25.00	2.00
1 1/2 to 3	103B	25.00	103BR	28.50	2.00
1 3/4 to 2	103C	28.00	.....	.....	2.00
2 1/2 to 3	105	40.00	105R	50.00	3.00

OSTER PATENT ADJUSTABLE DIE STOCKS
For Pipe

Nos. 0 to 4 1/2

No.	Threads Pipe, inches	PRICE EACH		Extra Dies Per Set (4 Pieces)
		Without Cut-off	With Cut-off	
0	1/8 to 1/2	\$12.00	\$15.00	\$1.25
1	1/8 " 3/4	13.00	16.00	1.50
1 1/2	1/4 " 1	14.00	17.00	1.50
2	1/4 " 1 1/4	17.00	20.00	1.75
3	1 " 2	22.00	25.00	2.00
4	1 1/2 " 2	25.00	28.00	2.00
4 1/2	3/8 " 2	28.00	31.00	2.50
5	1 1/2 " 3	40.00	45.00	3.00

Nos. 5 and 6 have four arms.

OSTER PATENT RATCHET DIE STOCKS

For Pipe

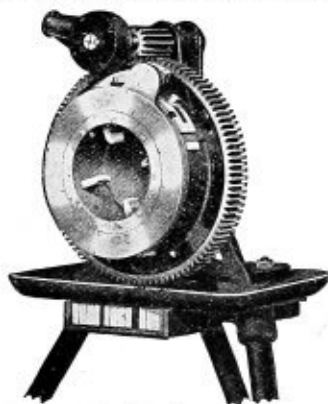


Ratchet No. 10

No.	Threads Pipe, inches	PRICE EACH		Extra Dies Per Set (4 Pieces)
		Without Cut-off	With Cut-off	
7	1 to 2	\$25.00	\$28.00	\$2.50
7 1/2	1 1/2 " 2	28.50	31.50	2.50
8	2 1/2 " 4	60.00	65.00	3.50
10	2 1/2 " 5	75.00	90.00	4.50
11	2 1/2 " 5	70.00	85.00	4.50

Cutting off attachments cannot be added after tool has left the factory.

OSTER GEARED DIE STOCKS



A portable pipe tool, low in price, simple in construction and operation. Threads all size pipe, 2 1/2 to 6 inches. STRICTLY A ONE-MAN OUTFIT. Instantly adjustable to all variations.

No. 16 for 2 1/2, 3, 3 1/2 and 4 inch Pipe

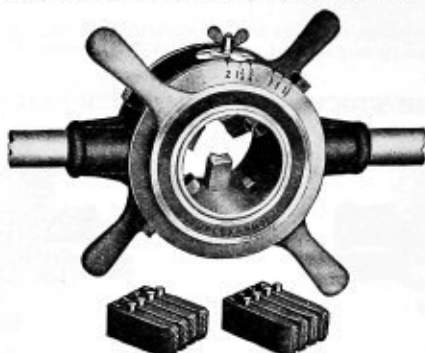
Description	Weight pounds	Price Each	EXTRA PARTS	
			Rest Stand	Dies Sets
Stock only.....	100	\$ 80.00	\$10.00	\$4.00
With Bench Bracket.....	125	85.00	10.00	4.00
" " and Pan.....	135	90.00	10.00	4.00
Complete with Tripod.....	200	100.00	10.00	4.00

No. 17 for 2 1/2, 3, 3 1/2, 4, 4 1/2, 5 and 6 inch Pipe

Description	Weight pounds	Price Each	Rest Stand	Dies Sets
Stock only.....	100	\$100.00	\$10.00	\$5.00
With Bench Bracket.....	120	155.00	10.00	5.00
" " and Pan.....	200	160.00	10.00	5.00
Complete with Tripod.....	250	170.00	10.00	5.00

HART'S ADJUSTABLE DUPLEX PIPE DIE STOCKS

The adjustable quick opening dies obviate turning back over-finished threads; dies throw open and stock is lifted off saving time and wear on dies.



Adjustable to suit any variation in size of pipe and fittings, so that tight joints can always be obtained.

Dies cut easily because of the clearance given them and they can be sharpened as readily as a chisel.

No.	Threads Pipe	Without Cut-off	With Cut-off	Price Complete Set Dies	No. Single Sets in Complete Set	Price of Single Set (4 pcs.)	Price Each Cutting off Tools
1	1/4, 1/4, 3/4, 1, 1 1/4 pipe	\$13.00	\$16.00	\$4.50	3	\$1.50	\$0.40
2	1/4, 3/8, 1/2, 3/4, 1, 1 1/4	17.00	20.00	5.25	3	1.75	.40
3	1, 1 1/4, 1 1/2, 2	22.00	25.00	4.00	2	2.00	.40
3 1/2	1/2, 3/4, 1, 1 1/4, 1 1/2, 2	25.00	28.00	6.00	3	2.00	.40
4	1 1/4, 2, 2 1/2, 3	40.00	45.00	7.00	2	3.50	.50
5	2 1/2, 3, 3 1/2, 4	55.00	60.00	8.00	2	4.00	.50
*8	1, 1 1/4, 1 1/2, 2	25.00	28.00	4.00	2	2.00	.50
*9	2 1/2, 3, 3 1/2, 4	60.00	65.00	8.00	2	4.00	.75

*Nos. 8 and 9 are made with ratchet.

THE TOLEDO PIPE THREADING DEVICE

Extremely simple in principle; dies can be changed at a moment's notice. The gradual, accurately gauged, expansion of dies as thread is being cut insures a thread of standard taper, clean cut and perfect. Dies may be continually reground to half their original surface without interfering with standard size of threads cut.



No. 1 Device



No. 3 Device

No.	For Threading Pipe Size, inches	Weight, Pounds	Price Each	EXTRA DIES	
				No. Dies in Set	Price Each
1	1, 1 1/4, 1 1/2, 2	---	\$ 24.00	4	\$ 2.50
* 1A	1, 1 1/4, 1 1/2, 2	---	30.00	4	2.50
1 1/2 R	2, 2 1/2, 3	---	50.00	4	2.50
+ 2	2 1/2, 3, 3 1/2, 4	60	100.00	5	8.00
+ 3	4 1/2, 5, 6, 7, 8	190	300.00	5	12.00
+ 4	9, 10, 12	225	500.00	5	20.00

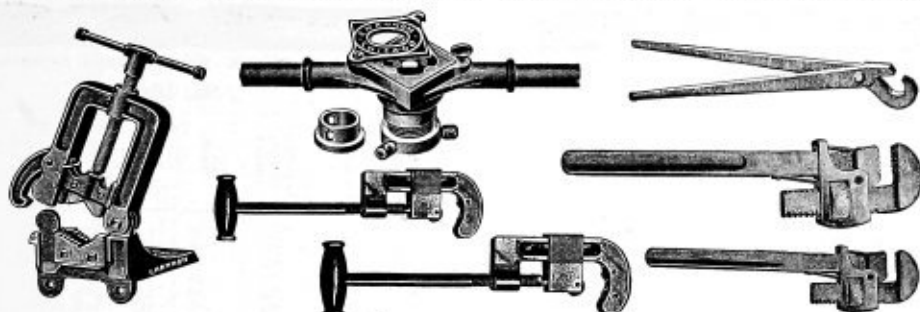
* No. 1A is similar to the No. 1 device (shown in cut) except with ratchet attachment for use in difficult crowded places.

+ Nos. 2, 3 and 4 are adjustable, geared devices with ratchet handle attachment for threading the larger sizes of pipe and fittings. Each is strictly a one man machine.

SPECIAL PIPE CUTTING AND THREADING OUTFIT

For All Size Pipe from $\frac{1}{8}$ to 2 inches

A practical and convenient outfit, containing the tools necessary for taking care of work which, without it, would require the services of a Plumber or a Steamfitter. The tools are all well-known standard makes.



- 1 No. 0-A. Malleable Hinged Pipe Vise holding pipe from $\frac{1}{8}$ inch to 2 inches inclusive.
 1 No. 1. Barnes 3-Wheel Pipe Cutter cutting Pipe from $\frac{1}{8}$ inch to $\frac{3}{4}$ inch inclusive.
 1 No. 2. Barnes 3-Wheel Pipe Cutter cutting Pipe from $\frac{1}{2}$ inch to 2 inches inclusive.
 1 Channon's Special Pipe Stock and Dies threading pipe from $\frac{1}{8}$ inch up to 2 inches inclusive.
 1 10-inch Stillson Wrench for pipe up to 1 inch inclusive.
 1 18-inch Stillson Wrench for pipe up to 2 inches inclusive.
 1 Pair Common Pipe Tongs for pipe up to 2 inches inclusive.

Price, Per Set\$25.50

ARMSTRONG'S ADJUSTABLE STOCKS AND DIES

For Threading Pipe



No. 6 stock has four handles and one die; the change from $2\frac{1}{2}$ to 3 inches is made by simply reversing the dies end for end, when they will cut the two standard sizes without further adjustment.

Stock No.	Pipe Dies and Guides	Size, inches	Price Complete	Price Stocks	Price Right or Left Dies	Price Guide
1	4	$\frac{1}{8}$ to $\frac{1}{2}$	\$ 9.00	\$ 3.25	\$ 1.25	\$ 0.20
2	5	$\frac{1}{4}$ to 1	12.00	4.00	1.50	.25
2X	6	$\frac{1}{8}$ to 1	14.00	4.00	1.50	.25
2½	4	$\frac{1}{8}$ to $1\frac{1}{4}$	12.00	4.50	3.25	.40
3	5	$\frac{3}{4}$ to 2	28.50	7.00	4.00	.50
3X	4	1 to 2	24.00	7.00	4.00	.50
3XX	3	$1\frac{1}{4}$ to 2	20.00	7.00	4.00	.50
4	4	1 to 2	21.00	7.00	3.00	.50
6	1	$2\frac{1}{2}$ & 3	40.00	25.00	15.00	1.00
7	2	$2\frac{1}{2}$ to 4	60.00	30.00	16.00	1.50
7XX	1	$3\frac{1}{2}$ & 4	45.00	30.00	16.00	1.50

THE NYE "EASY CUTTER" PIPE DIE

Shipped Subject to Acceptance After 10-Day Trial

Will cut with 70 per cent less friction than common dies.
 Chasers are set so teeth cut on a tangent making a shearing cut.
 Teeth are backed off, greatly reducing friction.
 Made from the highest grade tool steel obtainable.
 Hand made.
 Every one absolutely GUARANTEED.



Price List of the Nye Solid Dies

SIZE BLOCK 4x4x $\frac{3}{4}$ FOR No. 2 STOCK		SIZE BLOCK 3x3x $\frac{3}{4}$ FOR Nos. 1½ and 1¾ STOCK		SIZE BLOCK 2½x2½x $\frac{3}{4}$ FOR No. 1 STOCK		ADJUSTABLE DIES TO FIT ARMSTRONG STOCKS		
Cutting	Price Each	Cutting	Price Each	Cutting	Price Each	Cutting	To Fit Stock	Price Each
2	\$5.00	1½	\$4.50	1	\$4.00	$\frac{1}{4}$ in. to 1 in.	No. 2	\$4.50
1½	5.00	1¼	4.00	$\frac{3}{4}$	3.00	$\frac{1}{2}$ " " $1\frac{1}{4}$ "	" 2½	5.40
1¼	4.50	1	4.00	$\frac{1}{2}$	3.00	1 " " 2 "	" 3	6.00
1	4.50	$\frac{3}{4}$	3.50	$\frac{3}{8}$	2.50			
$\frac{3}{4}$	4.00	$\frac{1}{2}$	3.50	$\frac{1}{4}$	2.50			
$\frac{1}{2}$	4.00	$\frac{3}{8}$	3.00	$\frac{1}{8}$	2.00			
		$\frac{1}{4}$	3.00					

TAPER AND STRAIGHT SHANK DRILLS

All Our Drills Are Ground to Size After Hardening. They Will Not Vary 1/1000th of an Inch



With Taper Shanks

No. 102

Diameter, inches	Length, inches	Price Each	Shank Taper	Diameter, inches	Length, inches	Price Each	Shank Taper
1/16	5 1/2	\$0.45	No. 1, \$1.20	1/16	14 1/2	\$ 4.65	No. 4, \$4.00
1/8	5 1/2	.45		1/8	14 1/2	4.80	
3/16	5 1/2	.50		3/16	14 1/2	5.00	
1/4	5 1/2	.55		1/4	14 1/2	5.20	
5/16	5 1/2	.60		5/16	14 1/2	5.40	
3/8	5 1/2	.65		3/8	14 1/2	5.60	
7/16	5 1/2	.70		7/16	14 1/2	5.80	
1/2	5 1/2	.75		1/2	14 1/2	6.00	
5/8	5 1/2	.80		5/8	14 1/2	6.30	
3/4	5 1/2	.85		3/4	14 1/2	6.60	
7/8	5 1/2	.90	No. 2, \$1.80	7/8	14 1/2	7.20	No. 5, \$7.50
1	5 1/2	.95		1	14 1/2	7.50	
1 1/8	5 1/2	1.00		1 1/8	14 1/2	7.80	
1 1/4	5 1/2	1.10		1 1/4	14 1/2	8.10	
1 1/2	5 1/2	1.20		1 1/2	14 1/2	8.40	
1 3/4	5 1/2	1.30		1 3/4	14 1/2	8.60	
2	5 1/2	1.40		2	14 1/2	8.80	
2 1/4	5 1/2	1.50		2 1/4	14 1/2	9.00	
2 1/2	5 1/2	1.60		2 1/2	14 1/2	9.35	
2 3/4	5 1/2	1.70		2 3/4	14 1/2	9.50	
3	5 1/2	1.80	No. 3, \$2.50	3	14 1/2	9.65	No. 6, \$8.00
3 1/4	5 1/2	1.90		3 1/4	14 1/2	9.80	
3 1/2	5 1/2	2.00		3 1/2	14 1/2	10.20	
3 3/4	5 1/2	2.10		3 3/4	14 1/2	10.60	
4	5 1/2	2.20		4	14 1/2	11.20	
4 1/4	5 1/2	2.30		4 1/4	14 1/2	11.80	
4 1/2	5 1/2	2.40		4 1/2	14 1/2	12.40	
4 3/4	5 1/2	2.50		4 3/4	14 1/2	13.00	
5	5 1/2	2.60		5	14 1/2	13.60	
5 1/4	5 1/2	2.75		5 1/4	14 1/2	14.40	
5 1/2	5 1/2	2.90	No. 4, \$3.50	5 1/2	14 1/2	15.00	No. 7, \$9.00
5 3/4	5 1/2	3.00		5 3/4	14 1/2	15.60	
6	5 1/2	3.20		6	14 1/2	16.20	
6 1/4	5 1/2	3.40		6 1/4	14 1/2	16.80	
6 1/2	5 1/2	3.60		6 1/2	14 1/2	17.40	
6 3/4	5 1/2	3.80		6 3/4	14 1/2	18.00	
7	5 1/2	4.00		7	14 1/2	19.00	
7 1/4	5 1/2	4.20		7 1/4	14 1/2	20.00	
7 1/2	5 1/2	4.40		7 1/2	14 1/2	21.00	
7 3/4	5 1/2	4.60		7 3/4	14 1/2	22.00	
8	5 1/2	4.80	No. 5, \$4.50	8	14 1/2	23.00	No. 8, \$10.00
8 1/4	5 1/2	5.00		8 1/4	14 1/2	24.00	
8 1/2	5 1/2	5.20		8 1/2	14 1/2	25.00	
8 3/4	5 1/2	5.40		8 3/4	14 1/2	26.00	
9	5 1/2	5.60		9	14 1/2	27.00	
9 1/4	5 1/2	5.80		9 1/4	14 1/2	28.00	
9 1/2	5 1/2	6.00		9 1/2	14 1/2	29.00	
9 3/4	5 1/2	6.20		9 3/4	14 1/2	30.00	
10	5 1/2	6.40		10	14 1/2	31.00	
10 1/4	5 1/2	6.60		10 1/4	14 1/2	32.00	

Drills with grinding line furnished on sizes 3/8 and larger when desired.

Sixty-fourth sizes furnished at the price of next larger size. Drills with even twist furnished if wanted.

Drills with Graham Shank carried in stock and furnished at same prices as above.

STRAIGHT-FLUTE DRILLS

Farmer Drills



No. 102A. With Taper Shank

Suitable for drilling in brass, also in cored holes in any material. Use Taper Shank list (102) above on No. 102A and Straight Shank list (104) above on No. 104A.

LEFT HAND DRILLS



Same list price as right hand drills, but subject to special discount.



Straight Shank—Taper Shank Length

No. 104

Diameter, inches	Length, inches	Length of Shank, inches	Price Each	Diameter, inches	Length, inches	Length of Shank, inches	Price Each
1/16	3 1/2	12 1/2	\$0.35	1/16	14 1/2	43 1/2	\$ 4.80
1/8	3 1/2	12 1/2	.40	1/8	14 1/2	43 1/2	5.00
3/16	3 1/2	12 1/2	.45	3/16	14 1/2	43 1/2	5.20
1/4	3 1/2	12 1/2	.45	1/4	14 1/2	43 1/2	5.40
5/16	3 1/2	12 1/2	.50	5/16	14 1/2	43 1/2	5.60
3/8	3 1/2	12 1/2	.55	3/8	14 1/2	43 1/2	5.80
1/2	3 1/2	12 1/2	.60	1/2	14 1/2	43 1/2	6.00
5/8	3 1/2	12 1/2	.65	5/8	14 1/2	43 1/2	6.20
3/4	3 1/2	12 1/2	.70	3/4	14 1/2	43 1/2	6.40
7/8	3 1/2	12 1/2	.75	7/8	14 1/2	43 1/2	6.60
1	3 1/2	12 1/2	.80	1	14 1/2	43 1/2	6.80
1 1/8	3 1/2	12 1/2	.85	1 1/8	14 1/2	43 1/2	7.00
1 1/4	3 1/2	12 1/2	.90	1 1/4	14 1/2	43 1/2	7.20
1 1/2	3 1/2	12 1/2	.95	1 1/2	14 1/2	43 1/2	7.40
1 3/4	3 1/2	12 1/2	1.00	1 3/4	14 1/2	43 1/2	7.60
2	3 1/2	12 1/2	1.10	2	14 1/2	43 1/2	7.80
2 1/4	3 1/2	12 1/2	1.20	2 1/4	14 1/2	43 1/2	8.00
2 1/2	3 1/2	12 1/2	1.30	2 1/2	14 1/2	43 1/2	8.20
2 3/4	3 1/2	12 1/2	1.40	2 3/4	14 1/2	43 1/2	8.40
3	3 1/2	12 1/2	1.50	3	14 1/2	43 1/2	8.60
3 1/4	3 1/2	12 1/2	1.60	3 1/4	14 1/2	43 1/2	8.80
3 1/2	3 1/2	12 1/2	1.70	3 1/2	14 1/2	43 1/2	9.00
3 3/4	3 1/2	12 1/2	1.85	3 3/4	14 1/2	43 1/2	9.20
4	3 1/2	12 1/2	2.00	4	14 1/2	43 1/2	9.40
4 1/4	3 1/2	12 1/2	2.15	4 1/4	14 1/2	43 1/2	9.60
4 1/2	3 1/2	12 1/2	2.30	4 1/2	14 1/2	43 1/2	9.80
4 3/4	3 1/2	12 1/2	2.45	4 3/4	14 1/2	43 1/2	10.00
5	3 1/2	12 1/2	2.60	5	14 1/2	43 1/2	10.20
5 1/4	3 1/2	12 1/2	2.75	5 1/4	14 1/2	43 1/2	10.40
5 1/2	3 1/2	12 1/2	2.90	5 1/2	14 1/2	43 1/2	10.60
5 3/4	3 1/2	12 1/2	3.00	5 3/4	14 1/2	43 1/2	10.80
6	3 1/2	12 1/2	3.20	6	14 1/2	43 1/2	11.00
6 1/4	3 1/2	12 1/2	3.40	6 1/4	14 1/2	43 1/2	11.20
6 1/2	3 1/2	12 1/2	3.60	6 1/2	14 1/2	43 1/2	11.40
6 3/4	3 1/2	12 1/2	3.80	6 3/4	14 1/2	43 1/2	11.60
7	3 1/2	12 1/2	4.00	7	14 1/2	43 1/2	11.80
7 1/4	3 1/2	12 1/2	4.20	7 1/4	14 1/2	43 1/2	12.00
7 1/2	3 1/2	12 1/2	4.40	7 1/2	14 1/2	43 1/2	12.20
7 3/4	3 1/2	12 1/2	4.60	7 3/4	14 1/2	43 1/2	12.40
8	3 1/2	12 1/2	4.85	8	14 1/2	43 1/2	12.60

Drills 2 1/4 to 3 have shanks 1 1/2 in. diameter by 6 in. long.

*Discount changes at 1 1/2 in. diameter. Thirty-second sizes not listed take list midway between sixteenth sizes.



No. 104A. With Straight Shank

SINGLE TWIST DRILLS



STRAIGHT SHANK No. 108D

TAPER SHANK No. 108E

No. 108D. Same list as No. 104.

No. 108E. " " " " No. 102.

STEEL WIRE DRILLS



No. 107

No. by Gauge	Length, inches	Twist Cut In	Price Each	Price per Dozen	No. by Gauge	Length, inches	Twist Cut In	Price Each	Price per Dozen
1	4	2	\$0.22	\$2.35	41	1 1/8	1	\$0.10	\$1.10
2	3 3/4	2	.22	.235	42	1 1/8	1 1/8	.10	1.10
3	3 3/4	2	.22	.235	43	1 1/8	1 1/8	.10	1.10
4	3 3/4	2	.22	.235	44	1 1/8	1 1/8	.10	1.10
5	3 3/4	2	.22	.235	45	1 1/8	1 1/8	.10	1.10
6	3 3/4	2	.21	.225	46	1 1/8	1 1/8	.09	.95
7	3 3/4	2	.21	.225	47	1 1/8	1 1/8	.09	.95
8	3 3/4	2	.21	.225	48	1 1/8	1 1/8	.09	.95
9	3 3/4	2	.21	.225	49	1 1/8	1 1/8	.09	.95
10	3 3/4	2	.21	.225	50	1 1/8	1 1/8	.09	.95
11	3 3/4	2	.20	.210	51	1 1/8	1 1/8	.09	.95
12	3 3/4	2	.20	.210	52	1 1/8	1 1/8	.09	.95
13	3 3/4	2	.20	.210	53	1 1/8	1 1/8	.09	.95
14	3 3/4	2	.20	.210	54	1 1/8	1 1/8	.09	.95
15	3 3/4	2	.20	.210	55	1 1/8	1 1/8	.09	.95
16	3 3/4	2	.19	.195	56	1 1/8	1 1/8	.09	.95
17	3 3/4	2	.19	.195	57	1 1/8	1 1/8	.09	.95
18	3 3/4	2	.19	.195	58	1 1/8	1 1/8	.09	.95
19	3 3/4	2	.19	.195	59	1 1/8	1 1/8	.09	.95
20	3 3/4	2	.19	.195	60	1 1/8	1 1/8	.09	.95
21	3 3/4	2	.17	.175	61	1 1/8	1 1/8	.08	.90
22	3 3/4	2	.17	.175	62	1 1/8	1 1/8	.08	.90
23	3 3/4	2	.17	.175	63	1 1/8	1 1/8	.08	.90
24	3 3/4	2	.17	.175	64	1 1/8	1 1/8	.08	.90
25	3 3/4	2	.17	.175	65	1 1/8	1 1/8	.08	.90
26	3 3/4	2	.15	.155	66	1 1/8	1 1/8	.08	.90
27	3 3/4	2	.15	.155	67	1 1/8	1 1/8	.08	.90
28	3 3/4	2	.15	.155	68	1 1/8	1 1/8	.08	.90
29	3 3/4	2	.15	.155	69	1 1/8	1 1/8	.08	.90
30	3 3/4	2	.15	.155	70	1 1/8	1 1/8	.08	.90
31	3 3/4	2	.14	.140	71	1 1/8	1 1/8	.09	1.00
32	3 3/4	2	.14	.140	72	1 1/8	1 1/8	.09	1.00
33	3 3/4	2	.14	.140	73	1 1/8	1 1/8	.09	1.00
34	3 3/4	2	.14	.140	74	1 1/8	1 1/8	.09	1.00
35	3 3/4	2	.14	.140	75	1 1/8	1 1/8	.09	1.00
36	3 3/4	2	.12	.125	76	1 1/8	1 1/8	.09	1.00
37	3 3/4	2	.12	.125	77	1 1/8	1 1/8	.09	1.00
38	3 3/4	2	.12	.125	78	1 1/8	1 1/8	.09	1.00
39	3 3/4	2	.12	.125	79	1 1/8	1 1/8	.09	1.00
40	3 3/4	2	.12	.125	80	1 1/8	1 1/8	.09	1.00

Can be furnished Straight Flute if desired.

STRAIGHT SHANK CENTER DRILLS



No. 108A

Diameter, inches	Length, inches	Price per Doz.	Diameter, inches	Length, inches	Price per Doz.
1/8	1	\$0.80	1 1/8	1 1/2	\$1.70
3/16	1	.90	1 1/4	1 1/2	1.90
1/4	1 1/4	1.10	1 3/8	1 1/2	2.10
5/16	1 1/4	1.20	1 1/2	1 1/2	2.35
3/8	1 1/4	1.25	1 3/4	1 1/2	2.60
7/16	1 1/4	1.35	1 7/8	1 1/2	2.85
1/2	1 1/2	1.50	2	1 1/2	3.10

Can be furnished in wire and millimeter sizes to order.

JOBBER'S' DRILLS

STRAIGHT SHANK SHORT LENGTH



No. 105

Jobbers and Machinists Sets

Diameter, inches	Length, inches	Price Each	Price per Dozen
1/8	2 1/2	\$0.09	\$1.00
3/16	2 1/2	.10	1.10
1/4	2 1/2	.11	1.20
5/16	2 1/2	.12	1.35
3/8	2 1/2	.15	1.60
7/16	2 1/2	.16	1.80
1/2	2 1/2	.18	2.00
5/8	2 1/2	.20	2.20
3/4	2 1/2	.21	2.40
7/8	2 1/2	.23	2.65
1	2 1/2	.26	2.90
1 1/8	4	.28	3.15
1 1/4	4 1/4	.30	3.40
1 1/2	4 1/4	.32	3.65
1 3/4	4 1/4	.34	3.90
2	4 1/4	.36	4.20
2 1/4	4 1/4	.38	4.40
2 1/2	4 1/4	.40	4.60
2 3/4	4 1/4	.42	4.80
3	4 1/4	.45	5.10
3 1/4	5	.48	5.40
3 1/2	5 1/4	.50	5.70
3 3/4	5 1/4	.53	6.00
4	5 1/4	.55	6.40
4 1/4	5 1/4	.58	6.80
4 1/2	5 1/4	.63	7.20
4 3/4	5 1/4	.65	7.50
5	5 1/4	.67	7.75
5 1/4	6	.70	8.00

JOBBER'S' DRILLS



Straight Shank—Letter Sizes

No. 106

Diameter	Decimals of 1 inch	Length, inches	Price Each	Price per Dozen
A 1/16 inch.....	.234	3 1/2	\$0.26	\$2.90
B 1/8 inch.....	.258	3 1/2	.27	3.00
C 3/16 inch.....	.242	3 1/2	.28	3.10
D 1/4 inch.....	.246	3 1/2	.29	3.20
E 5/16 inch.....	.250	3 1/2	.30	3.30
F 3/8 inch.....	.257	4 1/4	.30	3.40
G 7/16 inch.....	.261	4 1/4	.31	3.50
H 1/2 inch.....	.266	4 1/4	.32	3.60
I 5/8 inch.....	.272	4 1/4	.33	3.70
J 3/4 inch.....	.277	4 1/4	.34	3.80
K 7/8 inch.....	.281	4 1/4	.35	3.90
L 1 inch.....	.286	4 1/4	.36	4.00
M 1 1/8 inch.....	.292	4 1/4	.36	4.10
N 1 1/4 inch.....	.296	4 1/4	.37	4.20
O 1 3/8 inch.....	.302	4 1/4	.38	4.30
P 1 1/2 inch.....	.323	4 1/4	.39	4.40
Q 1 3/4 inch.....	.332	4 1/4	.40	4.60
R 2 inch.....	.339	4 1/4	.42	4.80
S 2 1/4 inch.....	.348	4 1/4	.44	5.00
T 2 1/2 inch.....	.358	4 1/4	.45	5.20
U 2 3/4 inch.....	.368	5	.47	5.40
V 3 inch.....	.377	5 1/4	.49	5.60
W 3 1/4 inch.....	.386	5 1/4	.51	5.80
X 3 1/2 inch.....	.397	5 1/4	.53	6.00
Y 3 3/4 inch.....	.404	5 1/4	.55	6.40
Z 4 inch.....	.413	5 1/4	.59	6.80

SILVER AND DEMING DRILLS

Or Short Length Blacksmiths' Drills

No. 112



The above drills have shanks $2\frac{1}{4}$ inches long and $\frac{1}{2}$ inch diameter.

Diam., inches	Length, inches	Price Each	Diam., inches	Length, inches	Price Each
$\frac{1}{8}$	47	\$0.45	$\frac{1}{4}$	6	\$1.40
$\frac{3}{16}$	48		$\frac{3}{8}$	6	1.45
$\frac{1}{4}$	50		$\frac{1}{2}$	6	1.50
$\frac{5}{16}$	55		$\frac{3}{4}$	6	1.60
$\frac{3}{8}$	60		$\frac{1}{2}$	6	1.70
$\frac{7}{16}$	65		$\frac{1}{2}$	6	1.80
$\frac{1}{2}$	70		$\frac{1}{2}$	6	1.90
$\frac{9}{16}$	73		$\frac{1}{2}$	6	2.00
$\frac{5}{8}$	75		$\frac{1}{2}$	6	2.10
$\frac{11}{16}$	78		$\frac{1}{2}$	6	2.20
$\frac{3}{4}$	80		$\frac{1}{2}$	6	2.25
$\frac{13}{16}$	83		$\frac{1}{2}$	6	2.30
$\frac{7}{8}$	85		$\frac{1}{2}$	6	2.35
$\frac{15}{16}$	88		$\frac{1}{2}$	6	2.40
1	90		$\frac{1}{2}$	6	2.50
$1\frac{1}{16}$	95		$\frac{1}{2}$	6	2.60
$1\frac{1}{8}$	105		$\frac{1}{2}$	6	2.70
$1\frac{1}{4}$	110		$\frac{1}{2}$	6	2.80
$1\frac{3}{8}$	115		$\frac{1}{2}$	6	2.90
$1\frac{1}{2}$	120		$\frac{1}{2}$	6	3.00
$1\frac{5}{8}$	125		$\frac{1}{2}$	6	3.10
$1\frac{3}{4}$	130		$\frac{1}{2}$	6	3.20
$1\frac{7}{8}$	135		$\frac{1}{2}$	6	

PRENTICE DRILLS

Or Taper Length Blacksmiths' Drills

No. 111



These drills have shanks $2\frac{1}{4}$ inches long and $\frac{1}{2}$ inch diameter; twist same length as on taper and S. S. increase twist drills.

Diam., inches	Length, inches	Price Each	Diam., inches	Length, inches	Price Each
$\frac{1}{8}$	51	\$0.45	$\frac{1}{4}$	10	\$2.30
$\frac{3}{16}$	53	.45	$\frac{3}{8}$	10	2.45
$\frac{1}{4}$	55	.50	$\frac{1}{2}$	10	2.60
$\frac{5}{16}$	57	.55	$\frac{3}{4}$	10	2.75
$\frac{3}{8}$	61	.60	$\frac{1}{2}$	10	2.90
$\frac{7}{16}$	63	.65	$\frac{1}{2}$	11	3.00
$\frac{1}{2}$	67	.70	$\frac{1}{2}$	11	3.20
$\frac{9}{16}$	71	.75	$\frac{1}{2}$	11	3.40
$\frac{5}{8}$	75	.80	$\frac{1}{2}$	11	3.60
$\frac{11}{16}$	79	.85	$\frac{1}{2}$	11	3.80
$\frac{3}{4}$	83	.90	$\frac{1}{2}$	11	4.00
$\frac{7}{8}$	87	.95	$\frac{1}{2}$	11	4.20
1	91	1.00	$\frac{1}{2}$	11	4.40
$1\frac{1}{16}$	95	1.10	$\frac{1}{2}$	11	4.60
$1\frac{1}{8}$	99	1.20	$\frac{1}{2}$	11	4.80
$1\frac{1}{4}$	103	1.30	$\frac{1}{2}$	11	5.00
$1\frac{3}{8}$	107	1.40	$\frac{1}{2}$	11	5.20
$1\frac{1}{2}$	111	1.50	$\frac{1}{2}$	11	5.40
$1\frac{5}{8}$	115	1.60	$\frac{1}{2}$	11	5.60
$1\frac{3}{4}$	119	1.70	$\frac{1}{2}$	11	5.80
$1\frac{7}{8}$	123	1.85	$\frac{1}{2}$	11	6.00
2	127	2.00	$\frac{1}{2}$	11	
$2\frac{1}{8}$	131	2.15	$\frac{1}{2}$	11	

COE'S DRILLS

No. 110

Fitting Coe's Blacksmiths' Drill Press and
Prentice's Drill Press No. 3

Shanks on these drills are $2\frac{1}{4}$ inches long and $\frac{1}{2}$ inch (flat exactly) diameter.

Diam., inches	Length, inches	Price Each	Diam., inches	Length, inches	Price Each
$\frac{1}{8}$	47	\$0.55	$\frac{1}{4}$	6	\$1.70
$\frac{3}{16}$	51	.58	$\frac{3}{8}$	6	1.80
$\frac{1}{4}$	55	.60	$\frac{1}{2}$	6	1.90
$\frac{5}{16}$	59	.65	$\frac{1}{2}$	6	2.00
$\frac{3}{8}$	63	.70	$\frac{1}{2}$	6	2.10
$\frac{7}{16}$	67	.73	$\frac{1}{2}$	6	2.20
$\frac{1}{2}$	71	.75	$\frac{1}{2}$	6	2.25
$\frac{9}{16}$	75	.80	$\frac{1}{2}$	6	2.30
$\frac{5}{8}$	79	.85	$\frac{1}{2}$	6	2.35
$\frac{11}{16}$	83	.88	$\frac{1}{2}$	6	2.40
$\frac{3}{4}$	87	.90	$\frac{1}{2}$	6	2.50
$\frac{7}{8}$	91	.93	$\frac{1}{2}$	6	2.60
1	95	.95	$\frac{1}{2}$	6	2.70
$1\frac{1}{16}$	99	.98	$\frac{1}{2}$	6	2.80
$1\frac{1}{8}$	103	1.00	$\frac{1}{2}$	6	2.90
$1\frac{1}{4}$	107	1.03	$\frac{1}{2}$	6	3.00
$1\frac{3}{8}$	111	1.05	$\frac{1}{2}$	6	3.10
$1\frac{1}{2}$	115	1.10	$\frac{1}{2}$	6	3.20
$1\frac{5}{8}$	119	1.15	$\frac{1}{2}$	6	3.30
$1\frac{3}{4}$	123	1.20	$\frac{1}{2}$	6	3.40
$1\frac{7}{8}$	127	1.25	$\frac{1}{2}$	6	3.50
2	131	1.30	$\frac{1}{2}$	6	3.60
$2\frac{1}{8}$	135	1.35	$\frac{1}{2}$	6	3.80
$2\frac{1}{4}$	139	1.40	$\frac{1}{2}$	6	4.00
$2\frac{3}{8}$	143	1.45	$\frac{1}{2}$	6	4.20
$2\frac{1}{2}$	147	1.55	$\frac{1}{2}$	6	4.40
$2\frac{5}{8}$	151	1.60	$\frac{1}{2}$	6	4.60

*Discount changes at $1\frac{1}{8}$ inch diameter.

TAPER SQUARE SHANK DRILLS

Fitting Ratchets



No. 109E

Diam., inches	Length, inches	Price Each	Diam., inches	Length, inches	Price Each
$\frac{1}{8}$	47	\$0.90	$\frac{1}{4}$	8	\$2.40
$\frac{3}{16}$	49	.95	$\frac{3}{8}$	8	2.55
$\frac{1}{4}$	51	.95	$\frac{1}{2}$	8	2.70
$\frac{5}{16}$	53	1.00	$\frac{3}{4}$	8	2.85
$\frac{3}{8}$	55	1.00	$\frac{1}{2}$	9	2.95
$\frac{7}{16}$	57	1.05	$\frac{1}{2}$	9	3.10
$\frac{1}{2}$	59	1.10	$\frac{1}{2}$	9	3.25
$\frac{9}{16}$	61	1.15	$\frac{1}{2}$	9	3.40
$\frac{5}{8}$	63	1.20	$\frac{1}{2}$	9	3.55
$\frac{11}{16}$	65	1.25	$\frac{1}{2}$	9	3.70
$\frac{3}{4}$	67	1.25	$\frac{1}{2}$	9	3.85
$\frac{7}{8}$	69	1.30	$\frac{1}{2}$	9	4.00
1	71	1.30	$\frac{1}{2}$	9	4.15
$1\frac{1}{16}$	73	1.35	$\frac{1}{2}$	9	4.30
$1\frac{1}{8}$	75	1.35	$\frac{1}{2}$	9	4.45
$1\frac{1}{4}$	77	1.40	$\frac{1}{2}$	9	4.60
$1\frac{3}{8}$	79	1.45	$\frac{1}{2}$	9	4.75
$1\frac{1}{2}$	81	1.45	$\frac{1}{2}$	9	4.90
$1\frac{5}{8}$	83	1.50	$\frac{1}{2}$	9	5.05
$1\frac{3}{4}$	85	1.55	$\frac{1}{2}$	9	5.20
$1\frac{7}{8}$	87	1.65	$\frac{1}{2}$	9	5.35
2	89	1.75	$\frac{1}{2}$	9	5.50
$2\frac{1}{8}$	91	1.90	$\frac{1}{2}$	9	5.65
$2\frac{1}{4}$	93	2.05	$\frac{1}{2}$	9	5.80
$2\frac{3}{8}$	95	2.20	$\frac{1}{2}$	9	5.95
$2\frac{1}{2}$	97	2.30	$\frac{1}{2}$	9	6.10

We can also furnish Shank B, $\frac{3}{4}$ -inch by $\frac{1}{2}$ -inch, $1\frac{1}{8}$ inches long; regularly furnished with Shank A, $\frac{3}{4}$ -inch by $\frac{1}{2}$ -inch, $1\frac{1}{8}$ inches long.

THREE AND FOUR-GROOVE DRILLS

With Straight and Taper Shanks



Three-Groove T. S. Drill No. 102B
Four-Groove T. S. Drill No. 102C



Three-Groove S. S. Drill No. 104B
Four-Groove S. S. Drill No. 104C

Size, inches	Length, inches	Price, Each	Size, inches	Length, inches	Price, Each
1-4	6 1-8	\$1.50	1 3-8	14 1-2	\$ 5.60
9-32	6 1-4	1.60	1 13-32	14 5-8	5.80
5-16	6 3-8	1.60	1 7-16	14 3-4	6.00
11-32	6 1-2	1.70	1 15-32	14 7-8	6.20
3-8	6 3-4	1.70	*1 1-2	15	6.40
13-32	7	1.75	1 17-32	15 1-8	6.65
7-16	7 1-4	1.80	1 9-16	15 1-4	6.90
15-32	7 1-2	1.85	1 19-32	15 3-8	7.15
1-2	7 3-4	1.90	1 5-8	15 1-2	7.40
17-32	8	1.95	1 21-32	15 5-8	7.65
9-16	8 1-4	2.00	1 11-16	15 3-4	7.90
			1 23-32	15 7-8	8.15
19-32	8 1-2	2.30	1 3-4	16	8.40
5-8	8 3-4	2.60	1 25-32	16 1-8	8.60
21-32	9	2.70	1 13-16	16 1-4	8.80
11-16	9 1-4	2.75	1 27-32	16 3-8	9.00
23-32	9 1-2	2.85	1 7-8	16 1-2	9.20
3-4	9 3-4	2.90	1 29-32	16 1-2	9.35
25-32	9 7-8	3.00	1 15-16	16 1-2	9.50
13-16	10	5.05	1 31-32	16 1-2	9.65
27-32	10 1-4	3.15	2	16 1-2	9.80
7-8	10 1-2	3.20			
29-32	10 5-8	3.30	2 1-32	16 1-2	10.20
			2 1-16	17	10.60
15-16	10 3-4	3.40	2 1-8	17	11.20
31-32	10 7-8	3.50	2 3-16	17	12.00
1	11	3.60	2 1-4	17 1-2	12.80
11-32	11 1-8	3.70	2 5-16	17 1-2	13.60
11-16	11 1-4	3.80	2 3-8	18	14.40
13-32	11 1-2	3.90	2 7-16	18 1-2	15.00
11-8	11 3-4	4.00	2 1-2	19	15.60
15-32	11 7-8	4.25	2 9-16	19 1-4	16.20
13-16	12	4.50	2 5-8	19 1-2	16.80
17-32	12 1-8	4.65	2 11-16	20	17.90
11-4	12 1-2	4.80	2 3-4	20 1-2	19.00
			2 13-16	20 1-2	20.00
19-32	14 1-8	5.00	2 7-8	21	21.00
15-16	14 1-4	5.20	2 15-16	21	23.00
11-32	13 3-8	5.40	3	22	25.00

UNIVERSAL SELF-OILING DRILLS

With Straight and Taper Shanks



Style A

This represents the only oil groove drill made which can be used in any vertical drill press without making a change.



Style C

These drills are especially adapted for use in screw machines and turret lathes, and can be furnished in any length required.

PRICES QUOTED UPON APPLICATION.

TWO-GROOVED SHANK DRILLS

Taper Shank Length



No. 104 D

Size, inches	Length, inches	Price, Each	Size, inches	Length, inches	Price, Each
1/8	3 3/8	\$0.35	1 1/2	11 1/8	\$3.20
3/32	4 1/8	.40	1 1/16	11 1/4	3.40
1/16	5 1/8	.45	1 1/8	11 1/2	3.60
3/64	5 1/8	.45	1 1/8	11 3/4	3.80
1/8	5 5/8	.50	1 1/8	11 7/8	4.00
3/16	5 7/8	.55	1 1/4	12	4.20
1/4	6 1/8	.60	1 1/2	12 1/8	4.40
3/8	6 1/4	.65	1 3/4	12 1/2	4.50
1/2	6 3/8	.70	1 3/8	14 1/8	4.65
5/8	6 1/2	.75	1 5/8	14 1/4	4.80
3/4	6 3/4	.80	1 3/4	14 3/8	5.00
7/8	7	.85	1 7/8	14 1/2	5.20
1	7 1/4	.90	1 3/2	14 5/8	5.40
	7 1/2	.95	1 1/2	14 3/4	5.60
	7 3/4	1.00	1 1/2	14 7/8	5.80
	8	1.10	*1 1/2	15	6.00
	8 1/4	1.20	1 1/2	15 1/8	6.30
	8 1/2	1.30	1 1/2	15 1/4	6.60
	8 3/4	1.40	1 1/2	15 1/2	6.90
	9	1.50	1 1/2	15 3/4	7.20
	9 1/4	1.60	1 1/2	15 5/8	7.50
	9 1/2	1.70	1 1/2	15 3/4	7.80
	9 3/4	1.85	1 1/2	15 7/8	8.10
	9 7/8	2.00	1 1/2	16	8.40
	10	2.15	1 1/2	16 1/8	8.60
	10 1/4	2.30	1 1/2	16 1/4	8.80
	10 1/2	2.45	1 1/2	16 3/8	9.00
	10 3/4	2.60	1 1/2	16 1/2	9.20
	10 7/8	2.75	1 1/2	16 5/8	9.35
	10 3/2	2.90	1 1/2	16 3/4	9.50
1	11	3.00	1 1/2	16 7/8	9.65
			2	16 1/2	9.80

*Discount changes at 1 1/2 inch diameter.
Sixty-fourth sizes furnished at the price of the next larger size.

TWO-GROOVED SHANK DRILLS

Jobbers' Length



No. 105 D

Take same list as jobbers' drills; see previous pages.

EXTRA LONG STRAIGHT SHANK TWIST DRILLS



Size, inches	Length, inches	Price, Each	Size, inches	Length, inches	Price, Each
1/8	6	\$0.55	1 1/2	10	\$1.25
3/32	6	.55	1 1/16	10	1.30
1/16	8	.65	1 1/8	12	1.55
3/64	8	.70	1 1/8	12	1.60
1/4	10	.90	1 1/4	12	1.65
5/16	10	1.00	1 1/2	12	1.75
3/8	10	1.10	1 3/4	12	2.00
1/2	10	1.10	1 3/8	12	2.10
5/8	10	1.20	1 3/4	12	2.30

STRAIGHT SHANK MACHINE BITS

For Wood



No. 108

Diameter	Length, inches	Price Each	Diameter	Length, inches	Price Each
1/8	3	\$0.20	1 1/2	6 1/2	\$0.95
3/16	3 1/2	.25	1 3/4	6 3/4	1.00
1/4	3 3/4	.30	1 7/8	6 7/8	1.15
5/16	3 1/2	.35	2	7	1.25
3/8	4	.40	2 1/8	7 1/2	1.35
7/16	4 1/2	.45	2 1/4	8	1.45
1/2	4 1/2	.50	2 3/8	8 1/2	1.55
5/8	4 1/2	.55	2 1/2	9	1.65
3/4	5	.65	2 3/4	9 1/2	1.75
7/8	5 1/2	.70	3	10	1.85
1 1/8	5 1/2	.75	3 1/8	10 1/2	1.95
1 1/4	5 1/2	.80	3 1/4	11	2.05
1 1/2	6	.85	3 1/2	11 1/2	2.15
			3 3/4	12	2.25
			4	12 1/2	2.35
			4 1/4	13	2.45

PRENTICE MACHINE BITS

For Wood. Fitting Blacksmiths' Drill Presses

These drills have shanks 2 1/2 inches long and 1/2-inch diameter.

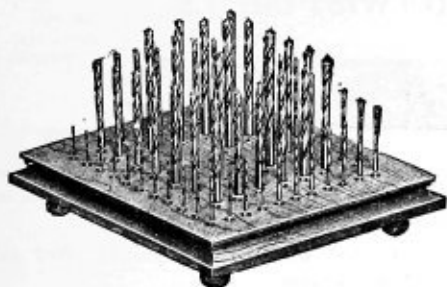


No. 108C

The following list applies also to Machine Bits with Morse Taper Shanks (No. 108B).

Diameter	Length, inches	Price Each	Diameter	Length, inches	Price Each
1/8	5 1/4	\$0.50	1 1/2	8 1/2	\$1.50
3/16	5 1/2	.50	1 3/4	8 3/4	1.60
1/4	5 3/4	.60	1 7/8	9	1.70
5/16	5 3/4	.60	2	9 1/2	1.80
3/8	6	.70	2 1/8	9 1/2	1.90
7/16	6 1/4	.75	2 1/4	9 3/4	2.00
1/2	6 1/2	.80	2 3/8	10	2.10
5/8	6 3/4	.85	2 1/2	10 1/2	2.20
3/4	6 3/4	.90	2 3/4	10 3/4	2.30
7/8	7	.95	3	11	2.40
1	7 1/4	1.00	3 1/8	11 1/2	2.50
1 1/8	7 1/2	1.05	3 1/4	11 3/4	2.60
1 1/4	7 3/4	1.10	3 1/2	12	2.70
1 1/2	8	1.15	3 3/4	12 1/2	2.80
1 3/4	8 1/4	1.20	4	13	2.90
2	8 1/2	1.25	4 1/4	13 1/2	3.00
2 1/4	8 3/4	1.30	4 1/2	14	3.10
2 1/2	9	1.35	4 3/4	14 1/2	3.20
2 3/4	9 1/4	1.40	5	15	3.30
3	9 1/2	1.45	5 1/4	15 1/2	3.40
3 1/4	9 3/4	1.50	5 1/2	16	3.50
3 1/2	10	1.55	5 3/4	16 1/2	3.60
3 3/4	10 1/4	1.60	6	17	3.70
4	10 1/2	1.65	6 1/4	17 1/2	3.80
4 1/4	10 3/4	1.70	6 1/2	18	3.90
4 1/2	11	1.75	6 3/4	18 1/2	4.00
4 3/4	11 1/4	1.80	7	19	4.10
5	11 1/2	1.85	7 1/4	19 1/2	4.20
5 1/4	11 3/4	1.90	7 1/2	20	4.30
5 1/2	12	1.95	7 3/4	20 1/2	4.40
5 3/4	12 1/4	2.00	8	21	4.50
6	12 1/2	2.05	8 1/4	21 1/2	4.60
6 1/4	12 3/4	2.10	8 1/2	22	4.70
6 1/2	13	2.15	8 3/4	22 1/2	4.80
6 3/4	13 1/4	2.20	9	23	4.90
7	13 1/2	2.25	9 1/4	23 1/2	5.00
7 1/4	13 3/4	2.30	9 1/2	24	5.10
7 1/2	14	2.35	9 3/4	24 1/2	5.20
7 3/4	14 1/4	2.40	10	25	5.30
8	14 1/2	2.45	10 1/4	25 1/2	5.40
8 1/4	14 3/4	2.50	10 1/2	26	5.50
8 1/2	15	2.55	10 3/4	26 1/2	5.60
8 3/4	15 1/4	2.60	11	27	5.70
9	15 1/2	2.65	11 1/4	27 1/2	5.80
9 1/4	15 3/4	2.70	11 1/2	28	5.90
9 1/2	16	2.75	11 3/4	28 1/2	6.00
9 3/4	16 1/4	2.80	12	29	6.10
10	16 1/2	2.85	12 1/4	29 1/2	6.20
10 1/4	16 3/4	2.90	12 1/2	30	6.30
10 1/2	17	2.95	12 3/4	30 1/2	6.40
10 3/4	17 1/4	3.00	13	31	6.50
11	17 1/2	3.05	13 1/4	31 1/2	6.60
11 1/4	17 3/4	3.10	13 1/2	32	6.70
11 1/2	18	3.15	13 3/4	32 1/2	6.80
11 3/4	18 1/4	3.20	14	33	6.90
12	18 1/2	3.25	14 1/4	33 1/2	7.00
12 1/4	18 3/4	3.30	14 1/2	34	7.10
12 1/2	19	3.35	14 3/4	34 1/2	7.20
12 3/4	19 1/4	3.40	15	35	7.30
13	19 1/2	3.45	15 1/4	35 1/2	7.40
13 1/4	19 3/4	3.50	15 1/2	36	7.50
13 1/2	20	3.55	15 3/4	36 1/2	7.60
13 3/4	20 1/4	3.60	16	37	7.70
14	20 1/2	3.65	16 1/4	37 1/2	7.80
14 1/4	20 3/4	3.70	16 1/2	38	7.90
14 1/2	21	3.75	16 3/4	38 1/2	8.00
14 3/4	21 1/4	3.80	17	39	8.10
15	21 1/2	3.85	17 1/4	39 1/2	8.20
15 1/4	21 3/4	3.90	17 1/2	40	8.30
15 1/2	22	3.95	17 3/4	40 1/2	8.40
15 3/4	22 1/4	4.00	18	41	8.50
16	22 1/2	4.05	18 1/4	41 1/2	8.60
16 1/4	22 3/4	4.10	18 1/2	42	8.70
16 1/2	23	4.15	18 3/4	42 1/2	8.80
16 3/4	23 1/4	4.20	19	43	8.90
17	23 1/2	4.25	19 1/4	43 1/2	9.00
17 1/4	23 3/4	4.30	19 1/2	44	9.10
17 1/2	24	4.35	19 3/4	44 1/2	9.20
17 3/4	24 1/4	4.40	20	45	9.30
18	24 1/2	4.45	20 1/4	45 1/2	9.40
18 1/4	24 3/4	4.50	20 1/2	46	9.50
18 1/2	25	4.55	20 3/4	46 1/2	9.60
18 3/4	25 1/4	4.60	21	47	9.70
19	25 1/2	4.65	21 1/4	47 1/2	9.80
19 1/4	25 3/4	4.70	21 1/2	48	9.90
19 1/2	26	4.75	21 3/4	48 1/2	10.00
19 3/4	26 1/4	4.80	22	49	10.10
20	26 1/2	4.85	22 1/4	49 1/2	10.20
20 1/4	26 3/4	4.90	22 1/2	50	10.30
20 1/2	27	4.95	22 3/4	50 1/2	10.40
20 3/4	27 1/4	5.00	23	51	10.50
21	27 1/2	5.05	23 1/4	51 1/2	10.60
21 1/4	27 3/4	5.10	23 1/2	52	10.70
21 1/2	28	5.15	23 3/4	52 1/2	10.80
21 3/4	28 1/4	5.20	24	53	10.90
22	28 1/2	5.25	24 1/4	53 1/2	11.00
22 1/4	28 3/4	5.30	24 1/2	54	11.10
22 1/2	29	5.35	24 3/4	54 1/2	11.20
22 3/4	29 1/4	5.40	25	55	11.30
23	29 1/2	5.45	25 1/4	55 1/2	11.40
23 1/4	29 3/4	5.50	25 1/2	56	11.50
23 1/2	30	5.55	25 3/4	56 1/2	11.60
23 3/4	30 1/4	5.60	26	57	11.70
24	30 1/2	5.65	26 1/4	57 1/2	11.80
24 1/4	30 3/4	5.70	26 1/2	58	11.90
24 1/2	31	5.75	26 3/4	58 1/2	12.00
24 3/4	31 1/4	5.80	27	59	12.10
25	31 1/2	5.85	27 1/4	59 1/2	12.20
25 1/4	31 3/4	5.90	27 1/2	60	12.30
25 1/2	32	5.95	27 3/4	60 1/2	12.40
25 3/4	32 1/4	6.00	28	61	12.50
26	32 1/2	6.05	28 1/4	61 1/2	12.60
26 1/4	32 3/4	6.10	28 1/2	62	12.70
26 1/2	33	6.15	28 3/4	62 1/2	12.80
26 3/4	33 1/4	6.20	29	63	12.90
27	33 1/2	6.25	29 1/4	63 1/2	13.00
27 1/4	33 3/4	6.30	29 1/2	64	13.10
27 1/2	34	6.35	29 3/4	64 1/2	13.20
27 3/4	34 1/4	6.40	30	65	13.30
28	34 1/2	6.45	30 1/4	65 1/2	13.40
28 1/4	34 3/4	6.50	30 1/2	66	13.50
28 1/2	35	6.55	30 3/4	66 1/2	13.60
28 3/4	35 1/4	6.60	31	67	13.70
29	35 1/2	6.65	31 1/4	67 1/2	13.80
29 1/4	35 3/4	6.70	31 1/2	68	13.90
29 1/2	36	6.75	31 3/4	68 1/2	14.00
29 3/4	36 1/4	6.80	32	69	14.10
30	36 1/2	6.85	32 1/4	69 1/2	14.20
30 1/4	36 3/4	6.90	32 1/2	70	14.30
30 1/2	37	6.95	32 3/4	70 1/2	14.40
30 3/4	37 1/4	7.00	33	71	14.50
31	37 1/2	7.05	33 1/4	71 1/2	14.60
31 1/4	37 3/4	7.10	33 1/2	72	14.70
31 1/2	38	7.15	33 3/4	72 1/2	14.80
31 3/4	38 1/4	7.20	34	73	14.90
32	38 1/2	7.25	34 1/4	73 1/2	15.00
32 1/4	38 3/4	7.30	34 1/2	74	15.10
32 1/2	39	7.35	34 3/4	74 1/2	15.20
32 3/4	39 1/4	7.40	35	75	15.30
33	39 1/2	7.45	35 1/4	75 1/2	15.40
33 1/4	39 3/4	7.50	35 1/2	76	15.50
33 1/2	40	7.55	35 3/4	76 1/2	15.60
33 3/4	40 1/4	7.60	36	77	15.70
34	40 1/2	7.65	36 1/4	77 1/2	15.80
34 1/4	40 3/4	7.70	36 1/2	78	15.90
34 1/2	41	7.75	36 3/4	78 1/2	16.00
34 3/4	41 1/4	7.80	37	79	16.10
35	41 1/2	7.85	37 1/4	79 1/2	16.20
35 1/4	41 3/4	7.90	37 1/2	80	16.30
35 1/2	42	7.95	37 3/4	80 1/2	16.40
35 3/4	42 1/4	8.00	38	81	16.50
36	42 1/2	8.05	38 1/4	81 1/2	16.60
36 1/4	42 3/4	8.10	38 1/2	82	16.70
36 1/2	43	8.15	38 3/4	82 1/2	16.80
36 3/4	43 1/4	8.20	39	83	16.90
37	43 1/2	8.25	39 1/4	83 1/2	17.00
37 1/4	43 3/4	8.30	39 1/2	84	17.10
37 1/2	44	8.35	39 3/4	84 1/2	17.20
37 3/4	44 1/4	8.40	40	85	17.30
38	44 1/2	8.45	40 1/4	85 1/2	17.40
38 1/4	44 3/4	8.50	40 1/2	86	17.50
38 1/2	45	8.55	40 3/4	86 1/2	17.60
38 3/4	45 1/4	8.60	41	87	17.70
39	45 1/2	8.65	41 1/4	87 1/2	17.80
39 1/4	45 3/4	8.70	41 1/2	88	17.90
39 1/2	46	8.75	41 3/4	88 1/2	18.00
39 3/4	46 1/4	8.80	42	89	18.10
40	46 1/2	8.85	42 1/4	89 1/2	18.20
40 1/4	46 3/4	8.90	42 1/2	90	18.30
40 1/2	47	8.95	42 3/4	90 1/2	18.40
40 3/4	47 1/4	9.00	43	91	18.50
41	47 1/2	9.05	43 1/4	91 1/2	18.60
41 1/4	47 3/4	9.10	43 1/2	92	18.70
41 1/2	48	9.15	43 3/4	92 1/2	18.80
41 3/4	48 1/4	9.20	44	93	18.90
42	48 1/2	9.25	44 1/4	93 1/2	19.00
42 1/4	48 3/4	9.30	44 1/2	94	19.10
42 1/2	49	9.35	44 3/4	94 1/2	19.20
42 3/4	49 1/4	9.40	45	95	19.30
43	49 1/2	9.45	45 1/4	95 1/2	19.40
43 1/4	49 3/4	9.50	45 1/2	96	19.50
43 1/2	50	9.55	45 3/4	96 1/2	19.60
43 3/4	50 1/4	9.60	46	97	19.70
44	50 1/2	9.65	46 1/4	97 1/2	19.80
44 1/4	50 3/4	9.70	46 1/2	98	19.90
44 1/2	51	9.75	46 3/4	98 1/2	20.00
44 3/4	51 1/4	9.80	47	99	20.10
45	51 1/2	9.85	47 1/4	99 1/2	20.20
45 1/4	51 3/4	9.90	47 1/2	100	20.30
45 1/2	52	9.95	47 3/4	100 1/2	20.40
45 3/4	52 1/4	10.00	48	101	20.50
46	52 1/2	10.05	48 1/4	101 1/2	20.60
46 1/4	52 3/4	10.10	48 1/2	102	20.70
46 1/2	53	10.15	48 3/4	102 1/2	20.80
46 3/4	53 1/4	10.20	49	103	20.90
47	53 1/2	10.25	49 1/4	103 1/2	21.00
47 1/4	53 3/4	10.30	49 1/2	104	21.10
47 1/2	54	10.35	49 3/4	104 1/2	21.20
47 3/4	54 1/4	10.40	50	105	21.30
48	54 1/2	10.45	50 1/4	105 1/2	21.40
48 1/4	54 3/4	10.50	50 1/2	106	21.50
48 1/2	55	10.55	50 3/4		

TWIST DRILL SETS



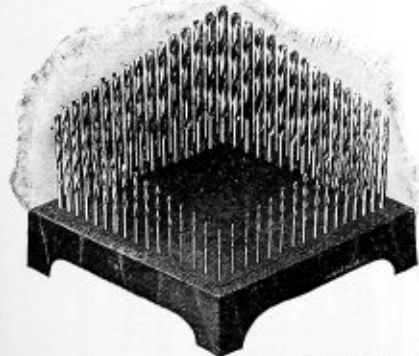
PRICES OF DRILLS PER SET

- No. 1. Set of Taper Shank Drills $\frac{1}{4}$ to 1 inch, varying by 16ths \$20.00
 No. 2. Set of Taper Shank Drills $\frac{3}{8}$ to $1\frac{1}{4}$ inch, varying by 16ths 34.50
 No. 3. Set of Taper Shank Drills $\frac{3}{8}$ to $\frac{3}{4}$ inch by 32nds, $\frac{1}{4}$ to $1\frac{1}{4}$ inch by 16ths 42.00
 No. 4. Set of Taper Shank Drills $\frac{3}{8}$ to $\frac{3}{4}$ inch by 32nds, $\frac{1}{4}$ to 2 inch by 16ths 131.00
 No. 5. Set Jobbers, Straight Shanks, $\frac{1}{8}$ to $\frac{1}{2}$ inch by 64ths, mounted 10.00
 No. 6. Set Jobbers, Straight Shanks, $\frac{1}{8}$ to $\frac{1}{2}$ inch by 32nds, mounted 5.40
 No. 7. Set Drills, from 60 to $\frac{3}{8}$ inch, mounted 9.90
 No. 8. Set Drills, Steel Wire Gauge, from No. 1 to No. 60, mounted 8.10
 No. 9. Half Set Drills, alternate Nos. from 1 to 59, mounted 4.30
 No. 11. Set of Taper Shank Drills, $\frac{3}{8}$ to 2 inch by 32nds 240.00
 No. 12. Set Machine Bits, $\frac{1}{8}$ inch to $\frac{1}{2}$ inch, mounted, varying by 32nds 7.00
 Price of Wood Block only each .50

METAL STANDS

Sets mounted on handsome Metal Stands, copperized finish. Each Drill fits in a hole in the stand, of corresponding size. On the 5A Stand the 32nd sizes are on one side of the stand and the 64th sizes on the other.

On the 8A Stand the even numbers are on one side and the odd numbers on the other.



- No. 5A. Jobbers Drills $\frac{1}{8}$ inch to $\frac{1}{2}$ by 69ths, \$11.50
 No. 8A. Wire Drills Nos. 1 to 60 incl. 9.75
 Metal Stands only 1.00

JEWELERS' SET



Contains Drills No. 30 ($\frac{1}{8}$ inch) to No. 65 Steel Wire Gauge.

Price per Set \$4.25
 Price, case only50

DRILL AND COUNTERSINK COMBINED



No. 114

Center holes absolutely perfect.

Size	Diameter of Body	Diameter of Drill	Price Each	Price per dozen
A	$\frac{7}{16}$	$\frac{3}{8}$ and $\frac{1}{2}$	\$0.15	\$1.50
B	$\frac{7}{16}$	$\frac{3}{8}$ and $\frac{1}{2}$	.15	1.50
C	$\frac{7}{16}$	$\frac{3}{8}$ and $\frac{1}{2}$	.15	1.50
D	$\frac{11}{16}$	No. 49 and No. 45	.15	1.50
E	$\frac{11}{16}$	$\frac{1}{2}$ and No. 45	.15	1.50
F	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.30	3.00
G	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.30	3.00
H	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.30	3.00
I	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.45	4.60
L	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.45	4.60
M	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.45	4.60
N	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.45	4.60
O	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.50	5.00
	$\frac{15}{16}$	$\frac{3}{4}$ and $\frac{1}{2}$	.50	5.00

DRILL AND COUNTERSINK COMBINED, WITH No. 1 TAPER SHANK



No. 114A

Size	Diam. Body	Diam. Drill	Each
P	$\frac{1}{8}$	$\frac{1}{8}$	\$0.75
Q	$\frac{1}{8}$	$\frac{3}{32}$	.75
R	$\frac{1}{8}$	$\frac{1}{4}$	.75
S	$\frac{1}{8}$	$\frac{3}{8}$	.75
T	$\frac{1}{8}$	$\frac{1}{2}$	.75
U	$\frac{1}{8}$	No. 22	.75
V	$\frac{1}{8}$	No. 13	.75

FLAT RATCHET DRILLS 6 Inches Long



Size, inches	Price Each	Size, inches	Price Each
$\frac{3}{8}$	\$0.60	1	\$0.65
$\frac{1}{2}$	.60	$1\frac{1}{8}$	.70
$\frac{5}{8}$	.60	$1\frac{1}{4}$	.75
$\frac{3}{4}$	.60	$1\frac{3}{4}$	.80
$\frac{7}{8}$	.60	$1\frac{1}{2}$	.85

"HERCULES" HIGH SPEED TWIST DRILLS



Strong, tough and absolutely accurate. Will drill perfect holes. Will not chatter. All of the toughest part of the steel retained on the cutting edge, which is not true of a milled drill. Size of shanks advanced on larger sizes of each class to prevent twisting off. The most efficient High Speed Drill on the market.

Made from Diamond High Speed Steel; grooves forged and twisted; standard taper shanks, fitted and welded solid. Fully finished and warranted against any mechanical imperfection.

Diameter, inches	Length, inches	Length of Twist, inches	Price Each	Shank Taper	Diameter, inches	Length, inches	Length of Twist, inches	Price Each	Shank Taper
$\frac{1}{4}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	\$ 0.95	No. 1	$\frac{1}{4}$	16	9 $\frac{1}{2}$	\$11.65	No. 5
$\frac{5}{16}$	6 $\frac{1}{4}$	3 $\frac{3}{4}$	.95		$\frac{5}{16}$	16 $\frac{1}{8}$	9 $\frac{3}{8}$	12.10
$\frac{3}{8}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	1.00		$\frac{7}{16}$	16 $\frac{1}{4}$	9 $\frac{1}{2}$	12.60	
$\frac{7}{16}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	1.00		$\frac{1}{2}$	16 $\frac{1}{2}$	9 $\frac{5}{8}$	13.05	
$\frac{1}{2}$	6 $\frac{3}{4}$	3 $\frac{3}{4}$	1.05		$\frac{9}{16}$	16 $\frac{3}{4}$	9 $\frac{3}{4}$	13.60	
$\frac{5}{8}$	7	4 $\frac{1}{4}$	1.10		$\frac{11}{16}$	16 $\frac{3}{4}$	9 $\frac{7}{8}$	14.10	
$\frac{3}{4}$	7 $\frac{1}{2}$	4 $\frac{1}{2}$	1.15		$\frac{13}{16}$	16 $\frac{3}{4}$	10	14.55	
$\frac{7}{8}$	7 $\frac{1}{2}$	4 $\frac{1}{2}$	1.20		$\frac{15}{16}$	16 $\frac{3}{4}$	10 $\frac{1}{8}$	15.00	
$\frac{15}{16}$	7 $\frac{3}{4}$	4 $\frac{3}{4}$	1.30		1	17	10 $\frac{1}{4}$	15.50	
$\frac{15}{16}$	8	5 $\frac{1}{4}$	1.40		1 $\frac{1}{8}$	17 $\frac{1}{8}$	10 $\frac{3}{8}$	16.00	
$\frac{1}{16}$	8 $\frac{1}{2}$	5	1.50	No. 2	1 $\frac{1}{8}$	17 $\frac{1}{8}$	10 $\frac{3}{8}$	16.55	No. 6
$\frac{1}{8}$	8 $\frac{1}{2}$	5	1.60		1 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{3}{8}$	17.10	
$\frac{3}{16}$	8 $\frac{3}{4}$	5 $\frac{1}{4}$	1.75		1 $\frac{3}{8}$	17 $\frac{3}{8}$	10 $\frac{3}{8}$	17.65	
$\frac{1}{4}$	9	5 $\frac{1}{2}$	1.90		1 $\frac{1}{2}$	17 $\frac{1}{2}$	10 $\frac{3}{8}$	18.20	
$\frac{5}{16}$	9 $\frac{1}{4}$	5 $\frac{3}{4}$	2.05		1 $\frac{5}{8}$	18 $\frac{1}{8}$	10 $\frac{3}{8}$	18.85	
$\frac{3}{8}$	9 $\frac{1}{2}$	6	2.25		1 $\frac{3}{4}$	18 $\frac{1}{4}$	10 $\frac{3}{8}$	19.50	
$\frac{7}{16}$	9 $\frac{3}{4}$	6 $\frac{1}{4}$	2.40		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	20.15	
$\frac{1}{2}$	9 $\frac{3}{8}$	6 $\frac{3}{8}$	2.60		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	20.80	
$\frac{11}{16}$	10 $\frac{1}{4}$	6 $\frac{1}{4}$	2.80		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	21.50	
$\frac{3}{4}$	10 $\frac{1}{2}$	6 $\frac{3}{4}$	3.00		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	22.20	
$\frac{15}{16}$	10 $\frac{3}{4}$	6 $\frac{3}{4}$	3.20	No. 3	1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	22.90	No. 7
1	10 $\frac{3}{4}$	6 $\frac{3}{4}$	3.45		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	23.60	
$1\frac{1}{16}$	10 $\frac{3}{4}$	6 $\frac{1}{2}$	3.75		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	24.30	
$1\frac{1}{8}$	10 $\frac{3}{4}$	6 $\frac{1}{2}$	4.05		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	25.00	
$1\frac{1}{4}$	11	6 $\frac{3}{4}$	4.35		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	25.70	
$1\frac{1}{2}$	11 $\frac{1}{8}$	6 $\frac{3}{8}$	4.75		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	26.40	
$1\frac{3}{4}$	11 $\frac{1}{4}$	7	5.10		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	27.10	
$1\frac{5}{8}$	11 $\frac{1}{2}$	7 $\frac{1}{4}$	5.45		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	27.80	
$1\frac{7}{8}$	12 $\frac{1}{4}$	7 $\frac{1}{4}$	5.80		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	28.50	
$1\frac{9}{8}$	12 $\frac{3}{8}$	7 $\frac{3}{8}$	6.20		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	29.20	
$1\frac{11}{8}$	13	7 $\frac{1}{2}$	6.55	No. 4	1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	29.90	No. 8
$1\frac{13}{8}$	13 $\frac{1}{8}$	7 $\frac{3}{8}$	6.90		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	30.60	
$1\frac{15}{8}$	13 $\frac{1}{4}$	8	7.20		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	31.30	
$1\frac{17}{8}$	14 $\frac{1}{8}$	8 $\frac{1}{8}$	7.60		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	32.00	
$1\frac{19}{8}$	14 $\frac{1}{4}$	8 $\frac{1}{4}$	8.00		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	33.00	
$1\frac{21}{8}$	14 $\frac{3}{8}$	8 $\frac{3}{8}$	8.40		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	34.00	
$1\frac{23}{8}$	15 $\frac{1}{8}$	8 $\frac{3}{4}$	8.80		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	35.00	
$1\frac{25}{8}$	15 $\frac{1}{4}$	8 $\frac{3}{4}$	9.20		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	36.00	
$1\frac{27}{8}$	15 $\frac{3}{8}$	8 $\frac{3}{4}$	9.60		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	37.00	
$1\frac{29}{8}$	15 $\frac{1}{2}$	8 $\frac{3}{4}$	10.00		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	38.00	
$1\frac{31}{8}$	15 $\frac{3}{4}$	8 $\frac{3}{4}$	10.40	No. 5	1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	39.00	No. 9
$1\frac{33}{8}$	15 $\frac{3}{4}$	9	10.80		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	40.00	
$1\frac{35}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	11.20		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	41.25	
$1\frac{37}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	11.60		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	42.50	
$1\frac{39}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	12.00		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	43.75	
$1\frac{41}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	12.40		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	45.00	
$1\frac{43}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	12.80		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	46.25	
$1\frac{45}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	13.20		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	47.50	
$1\frac{47}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	13.60		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	48.75	
$1\frac{49}{8}$	15 $\frac{3}{4}$	9 $\frac{1}{4}$	14.00		1 $\frac{7}{8}$	18 $\frac{3}{8}$	10 $\frac{3}{8}$	50.00	

DIAMOND HIGH SPEED TWIST DRILLS

The steel used in the manufacture of these tools was selected after several years experimenting with high speed steels to produce tools having the necessary temper to give the greatest wearing quality and retaining the requisite toughness to reduce breakage to a minimum.

WITH TAPER SHANKS



No. 402

Diameter, inches	Price Each	Length of Twist, inches	Length, inches	Shank Taper
$\frac{1}{16}$	\$ 0.90	1 $\frac{1}{4}$	4 $\frac{1}{8}$	No. 1
$\frac{3}{32}$	.90	1 $\frac{1}{2}$	4 $\frac{3}{8}$
$\frac{1}{8}$	.90	1 $\frac{3}{8}$	5 $\frac{1}{8}$
$\frac{9}{32}$	.90	2 $\frac{1}{8}$	5 $\frac{3}{8}$
$\frac{1}{4}$	.90	2 $\frac{1}{4}$	5 $\frac{7}{8}$
$\frac{5}{16}$	1.00	2 $\frac{3}{8}$	6 $\frac{1}{8}$	
$\frac{3}{8}$	1.10	2 $\frac{1}{2}$	6 $\frac{3}{8}$	
$\frac{7}{16}$	1.20	2 $\frac{3}{4}$	6 $\frac{1}{2}$	
$\frac{1}{2}$	1.30	3 $\frac{1}{8}$	6 $\frac{3}{4}$	
$\frac{9}{16}$	1.40	3 $\frac{1}{4}$	7	
$\frac{5}{8}$	1.50	3 $\frac{3}{8}$	7 $\frac{1}{4}$	
$\frac{11}{16}$	1.65	3 $\frac{1}{2}$	7 $\frac{3}{8}$	
$\frac{3}{4}$	1.75	3 $\frac{3}{4}$	7 $\frac{1}{2}$	
$\frac{7}{8}$	1.90	4	7 $\frac{3}{4}$	
$\frac{1}{2}$	2.00	4 $\frac{1}{4}$	8	
$\frac{1}{2}$	2.15	4 $\frac{1}{2}$	8 $\frac{1}{4}$	
$\frac{1}{2}$	2.25	4 $\frac{3}{4}$	8 $\frac{1}{2}$	No. 2
$\frac{1}{2}$	2.40	4 $\frac{1}{2}$	8 $\frac{1}{2}$	
$\frac{1}{2}$	2.50	4 $\frac{3}{4}$	8 $\frac{3}{4}$	
$\frac{1}{2}$	2.75	5	9	
$\frac{1}{2}$	3.00	5 $\frac{1}{4}$	9 $\frac{1}{4}$	
$\frac{1}{2}$	3.25	5 $\frac{1}{2}$	9 $\frac{1}{2}$	
$\frac{1}{2}$	3.50	5 $\frac{3}{4}$	9 $\frac{3}{4}$	
$\frac{1}{2}$	3.75	5 $\frac{7}{8}$	9 $\frac{7}{8}$	
$\frac{1}{2}$	4.00	6	10	
$\frac{1}{2}$	4.40	6 $\frac{1}{4}$	10 $\frac{1}{4}$	
$\frac{1}{2}$	4.75	6 $\frac{1}{2}$	10 $\frac{1}{2}$	
$\frac{1}{2}$	5.15	6 $\frac{3}{8}$	10 $\frac{3}{8}$	
$\frac{1}{2}$	5.50	5 $\frac{7}{8}$	10 $\frac{3}{4}$	
$\frac{1}{2}$	5.90	6	10 $\frac{7}{8}$	
$\frac{1}{2}$	6.25	6 $\frac{1}{8}$	11	
$\frac{1}{2}$	6.75	6 $\frac{1}{4}$	11 $\frac{1}{4}$	
$\frac{1}{2}$	7.25	6 $\frac{3}{8}$	11 $\frac{1}{2}$	No. 3
$\frac{1}{2}$	7.75	6 $\frac{1}{2}$	11 $\frac{3}{4}$	
$\frac{1}{2}$	8.25	6 $\frac{3}{4}$	11 $\frac{1}{2}$	
$\frac{1}{2}$	8.75	6 $\frac{7}{8}$	11 $\frac{3}{4}$	
$\frac{1}{2}$	9.25	7	11 $\frac{7}{8}$	
$\frac{1}{2}$	9.50	7 $\frac{1}{8}$	12	
$\frac{1}{2}$	10.15	7 $\frac{1}{4}$	12 $\frac{1}{8}$	
$\frac{1}{2}$	10.75	7 $\frac{3}{8}$	12 $\frac{1}{4}$	
$\frac{1}{2}$	11.50	8	14 $\frac{1}{8}$	
$\frac{1}{2}$	12.25	8 $\frac{1}{8}$	14 $\frac{1}{4}$	
$\frac{1}{2}$	13.00	8 $\frac{1}{4}$	14 $\frac{3}{8}$	
$\frac{1}{2}$	13.75	8 $\frac{3}{8}$	14 $\frac{1}{2}$	
$\frac{1}{2}$	14.65	8 $\frac{1}{2}$	14 $\frac{3}{4}$	
$\frac{1}{2}$	15.50	8 $\frac{3}{4}$	14 $\frac{7}{8}$	
$\frac{1}{2}$	16.40	8 $\frac{7}{8}$	15	
$\frac{1}{2}$	17.25	9	15 $\frac{1}{8}$	
$\frac{1}{2}$	18.15	9 $\frac{1}{8}$	15 $\frac{1}{4}$	No. 4
$\frac{1}{2}$	19.00	9 $\frac{1}{4}$	15 $\frac{3}{8}$	
$\frac{1}{2}$	20.00	9 $\frac{3}{8}$	15 $\frac{1}{2}$	
$\frac{1}{2}$	21.00	9 $\frac{7}{8}$	15 $\frac{3}{4}$	

WITH TAPER SHANKS

Continued

Diameter, inches	Price Each	Length of Twist, inches	Length, inches	Shank Taper
$\frac{1}{2}$	\$22.00	9 $\frac{1}{2}$	15 $\frac{5}{8}$	No. 4
$\frac{1}{2}$	23.00	9 $\frac{3}{8}$	15 $\frac{3}{4}$	
$\frac{1}{2}$	24.00	9 $\frac{1}{4}$	15 $\frac{7}{8}$	
$\frac{1}{2}$	25.00	9 $\frac{1}{8}$	16	
$\frac{1}{2}$	26.25	10	16 $\frac{1}{8}$	
$\frac{1}{2}$	27.50	10 $\frac{1}{8}$	16 $\frac{1}{4}$	
$\frac{1}{2}$	28.75	10 $\frac{1}{4}$	16 $\frac{3}{8}$	
$\frac{1}{2}$	30.00	10 $\frac{3}{8}$	16 $\frac{1}{2}$	
$\frac{1}{2}$	31.25	10 $\frac{1}{2}$	16 $\frac{3}{4}$	
$\frac{1}{2}$	32.50	10 $\frac{3}{4}$	16 $\frac{7}{8}$	
$\frac{1}{2}$	33.75	10 $\frac{7}{8}$	16 $\frac{1}{2}$	
$\frac{1}{2}$	35.00	10 $\frac{1}{2}$	16 $\frac{1}{4}$	

WITH STRAIGHT SHANKS (Taper Shank Length)



No. 404

Diameter, inches	Price Each	Length Shank, inches	Length, inches
$\frac{1}{16}$	\$ 0.90	2 $\frac{1}{8}$	2 $\frac{5}{8}$
$\frac{3}{32}$	.90	2 $\frac{1}{8}$	3 $\frac{1}{8}$
$\frac{1}{8}$	.90	2 $\frac{1}{8}$	3 $\frac{1}{4}$
$\frac{9}{32}$	.90	2 $\frac{1}{8}$	3 $\frac{3}{8}$
$\frac{1}{4}$	.90	2 $\frac{1}{8}$	3 $\frac{1}{2}$
$\frac{5}{16}$	1.00	2 $\frac{1}{8}$	3 $\frac{3}{4}$
$\frac{3}{8}$	1.10	2 $\frac{1}{8}$	4
$\frac{7}{16}$	1.20	2 $\frac{1}{8}$	4 $\frac{1}{8}$
$\frac{1}{2}$	1.30	2 $\frac{1}{8}$	4 $\frac{1}{4}$
$\frac{9}{16}$	1.40	2 $\frac{1}{8}$	4 $\frac{1}{2}$
$\frac{5}{8}$	1.50	2 $\frac{1}{8}$	4 $\frac{3}{4}$
$\frac{11}{16}$	1.65	2 $\frac{1}{8}$	5
$\frac{3}{4}$	1.75	2 $\frac{1}{8}$	5 $\frac{1}{8}$
$\frac{7}{8}$	1.90	2 $\frac{1}{8}$	5 $\frac{1}{4}$
$\frac{1}{2}$	2.00	2 $\frac{1}{8}$	5 $\frac{1}{2}$
$\frac{1}{2}$	2.15	3	5 $\frac{3}{4}$
$\frac{1}{2}$	2.25	3	6
$\frac{1}{2}$	2.40	3	6 $\frac{1}{8}$
$\frac{1}{2}$	2.50	3	6 $\frac{1}{4}$
$\frac{1}{2}$	2.75	3 $\frac{1}{4}$	6 $\frac{3}{8}$
$\frac{1}{2}$	3.00	3 $\frac{1}{2}$	6 $\frac{1}{2}$
$\frac{1}{2}$	3.25	3 $\frac{3}{4}$	6 $\frac{3}{4}$
$\frac{1}{2}$	3.50	3 $\frac{1}{2}$	6 $\frac{7}{8}$
$\frac{1}{2}$	3.75	3 $\frac{3}{4}$	7
$\frac{1}{2}$	4.00	3 $\frac{1}{2}$	7 $\frac{1}{8}$
$\frac{1}{2}$	4.40	3 $\frac{3}{4}$	7 $\frac{1}{4}$
$\frac{1}{2}$	4.75	3 $\frac{1}{2}$	7 $\frac{3}{8}$
$\frac{1}{2}$	5.15	3 $\frac{1}{2}$	7 $\frac{1}{2}$
$\frac{1}{2}$	5.50	3 $\frac{3}{4}$	7 $\frac{3}{4}$
$\frac{1}{2}$	5.90	3 $\frac{1}{2}$	7 $\frac{7}{8}$
$\frac{1}{2}$	6.25	4	8
$\frac{1}{2}$	6.75	4	8 $\frac{1}{8}$
$\frac{1}{2}$	7.25	4	8 $\frac{1}{4}$
$\frac{1}{2}$	7.75	4	8 $\frac{1}{2}$
$\frac{1}{2}$	8.25	4	8 $\frac{3}{4}$
$\frac{1}{2}$	8.90	4 $\frac{1}{4}$	8 $\frac{7}{8}$
$\frac{1}{2}$	9.50	4 $\frac{1}{2}$	9
$\frac{1}{2}$	10.15	4 $\frac{3}{4}$	9 $\frac{1}{8}$
$\frac{1}{2}$	10.75	4 $\frac{1}{2}$	9 $\frac{1}{4}$
$\frac{1}{2}$	11.50	4 $\frac{3}{4}$	9 $\frac{1}{2}$
$\frac{1}{2}$	12.25	4 $\frac{1}{2}$	9 $\frac{3}{4}$
$\frac{1}{2}$	13.00	4 $\frac{3}{4}$	9 $\frac{7}{8}$
$\frac{1}{2}$	13.75	5	10
$\frac{1}{2}$	14.65	5	10 $\frac{1}{8}$
$\frac{1}{2}$	15.50	5	10 $\frac{1}{4}$
$\frac{1}{2}$	16.40	5	10 $\frac{1}{2}$
$\frac{1}{2}$	17.25	5	10 $\frac{3}{4}$

Sixty-fourth sizes take list of next larger size.

DIAMOND HIGH SPEED TWIST DRILLS

JOBBER'S' LENGTH



No. 405

Diam. inches	Price Each	Length inches	Length Twist, inches	Diam. inches	Price Each	Length inches	Length Twist, inches
$\frac{1}{16}$	\$12.00	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{5}{16}$	\$10.50	$4\frac{3}{8}$	$3\frac{3}{8}$
$\frac{3}{32}$	10.00	$2\frac{5}{8}$	$1\frac{3}{8}$	$\frac{3}{8}$	10.50	$4\frac{1}{2}$	$3\frac{1}{2}$
$\frac{1}{8}$	9.00	$2\frac{3}{4}$	$1\frac{1}{2}$	$\frac{7}{16}$	12.00	$4\frac{5}{8}$	$3\frac{5}{8}$
$\frac{9}{32}$	9.00	$2\frac{7}{8}$	$1\frac{3}{4}$	$\frac{1}{2}$	12.00	$4\frac{3}{4}$	$3\frac{3}{4}$
$\frac{1}{4}$	8.50	3	$1\frac{1}{2}$	$\frac{9}{16}$	13.50	$4\frac{7}{8}$	$3\frac{7}{8}$
$\frac{5}{16}$	8.50	$3\frac{1}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	13.50	5	$3\frac{5}{8}$
$\frac{3}{8}$	7.50	$3\frac{1}{4}$	$2\frac{1}{8}$	$\frac{3}{4}$	15.00	$5\frac{1}{8}$	$3\frac{3}{4}$
$\frac{7}{16}$	7.50	$3\frac{3}{8}$	$2\frac{1}{8}$	$\frac{7}{8}$	15.00	$5\frac{1}{4}$	$3\frac{3}{4}$
$\frac{1}{2}$	6.50	$3\frac{1}{2}$	$2\frac{1}{8}$	$\frac{15}{16}$	17.00	$5\frac{3}{8}$	$4\frac{1}{8}$
$\frac{9}{16}$	7.35	$3\frac{3}{4}$	$2\frac{1}{8}$	$\frac{1}{2}$	17.00	$5\frac{1}{2}$	$4\frac{1}{8}$
$\frac{5}{8}$	7.35	$3\frac{3}{4}$	$2\frac{1}{8}$	$\frac{11}{16}$	18.75	$5\frac{3}{8}$	$4\frac{1}{8}$
$\frac{3}{4}$	7.35	$3\frac{3}{4}$	$2\frac{1}{8}$	$\frac{3}{4}$	18.75	$5\frac{1}{4}$	$4\frac{1}{8}$
$\frac{7}{8}$	7.35	4	$2\frac{1}{8}$	$\frac{13}{16}$	20.00	$5\frac{7}{8}$	$4\frac{1}{2}$
$\frac{15}{16}$	9.10	$4\frac{1}{8}$	$2\frac{1}{8}$	$\frac{1}{2}$	20.00	6	$4\frac{1}{2}$
$\frac{1}{2}$	9.10	$4\frac{1}{4}$	$2\frac{1}{8}$				

WITH STRAIGHT SHANKS

Letter Sizes



No. 406

Diameter	Decimal Diameter	Length, inches	Length of Twist, inches	Price per Dozen
A $\frac{1}{16}$	.234	$3\frac{1}{8}$	$2\frac{1}{8}$	\$ 7.35
B $\frac{3}{32}$	.238	$3\frac{1}{8}$	$2\frac{1}{8}$	7.35
C $\frac{1}{8}$	.242	$3\frac{1}{8}$	$2\frac{1}{8}$	7.35
D $\frac{9}{32}$	.246	$3\frac{1}{8}$	$2\frac{1}{8}$	7.35
E $\frac{1}{4}$	.250	$4\frac{1}{4}$	$2\frac{1}{8}$	7.35
F $\frac{5}{16}$	.257	$4\frac{1}{4}$	3	9.10
G $\frac{3}{8}$	.261	$4\frac{1}{4}$	3	9.10
H $\frac{7}{16}$	.266	$4\frac{1}{4}$	3	9.10
I $\frac{1}{2}$	.272	$4\frac{1}{4}$	3	9.10
J $\frac{9}{16}$	.277	$4\frac{1}{4}$	3	9.10
K $\frac{5}{8}$	.281	$4\frac{1}{4}$	3	9.10
L $\frac{3}{4}$	.290	$4\frac{1}{4}$	$2\frac{1}{2}$	10.50
M $\frac{7}{8}$	.295	$4\frac{1}{4}$	$2\frac{1}{2}$	10.50
N $\frac{15}{16}$	.302	$4\frac{1}{4}$	$2\frac{1}{2}$	10.50
O $\frac{1}{2}$	.316	$4\frac{1}{4}$	$2\frac{1}{8}$	10.50
P $\frac{1}{4}$	.323	$4\frac{3}{4}$	$3\frac{1}{8}$	12.00
Q $\frac{3}{16}$	.332	$4\frac{3}{4}$	$3\frac{1}{8}$	12.00
R $\frac{1}{8}$	.339	$4\frac{3}{4}$	$3\frac{1}{8}$	12.00
S $\frac{3}{32}$	.348	$4\frac{3}{4}$	$3\frac{1}{8}$	13.50
T $\frac{1}{16}$	.358	$4\frac{3}{4}$	$3\frac{1}{8}$	13.50
U $\frac{1}{32}$	.368	5	$3\frac{1}{8}$	13.50
V $\frac{1}{64}$	.377	5	$3\frac{1}{8}$	13.50
W $\frac{1}{128}$	.386	$5\frac{1}{8}$	$3\frac{1}{4}$	15.00
X $\frac{1}{256}$	.397	$5\frac{1}{4}$	$3\frac{1}{4}$	15.00
Y $\frac{1}{512}$	.404	$5\frac{1}{4}$	$3\frac{1}{8}$	15.00
Z $\frac{1}{1024}$	.413	$5\frac{1}{8}$	$3\frac{1}{8}$	17.00

WIRE GAUGE SIZES



No. 407

Number by Gauge	Price per Dozen	Diameter, Decimals of 1 inch	Length, inches	Length of Twist, inches
1	\$ 7.35	.2280	4	$2\frac{3}{8}$
2	7.35	.2210	$3\frac{1}{8}$	$2\frac{5}{8}$
3	7.35	.2130	$3\frac{1}{8}$	$2\frac{3}{4}$
4	7.35	.2090	$3\frac{1}{8}$	$2\frac{3}{4}$
5	7.35	.2055	$3\frac{1}{8}$	$2\frac{3}{4}$
6	7.35	.2040	$3\frac{1}{8}$	$2\frac{3}{4}$
7	7.35	.2010	$3\frac{1}{8}$	$2\frac{3}{4}$
8	7.35	.1990	$3\frac{1}{8}$	$2\frac{3}{4}$
9	7.35	.1960	$3\frac{1}{8}$	$2\frac{3}{4}$
10	7.35	.1935	$3\frac{1}{8}$	$2\frac{3}{4}$
11	7.35	.1910	$3\frac{1}{8}$	$2\frac{3}{4}$
12	7.35	.1890	$3\frac{1}{8}$	$2\frac{3}{4}$
13	7.50	.1850	$3\frac{1}{2}$	$2\frac{3}{4}$
14	7.50	.1820	$3\frac{1}{2}$	$2\frac{3}{4}$
15	7.50	.1800	$3\frac{1}{2}$	$2\frac{3}{4}$
16	7.50	.1770	$3\frac{1}{2}$	$2\frac{3}{4}$
17	7.50	.1730	$3\frac{1}{2}$	$2\frac{3}{4}$
18	7.50	.1695	$3\frac{1}{2}$	$2\frac{3}{4}$
19	7.50	.1660	$3\frac{1}{2}$	$2\frac{3}{4}$
20	7.50	.1610	$3\frac{1}{2}$	$2\frac{3}{4}$
21	7.50	.1590	$3\frac{1}{2}$	$2\frac{3}{4}$
22	7.50	.1570	$3\frac{1}{2}$	2
23	8.50	.1540	$3\frac{1}{2}$	$1\frac{3}{8}$
24	8.50	.1520	$3\frac{1}{2}$	$1\frac{3}{8}$
25	8.50	.1495	3	$1\frac{3}{8}$
26	8.50	.1470	2	$1\frac{3}{8}$
27	8.50	.1440	2	$1\frac{3}{8}$
28	8.50	.1405	$2\frac{1}{8}$	$1\frac{3}{8}$
29	8.50	.1360	$2\frac{1}{8}$	$1\frac{3}{8}$
30	8.50	.1285	$2\frac{1}{8}$	$1\frac{3}{8}$
31	9.00	.1200	$2\frac{1}{8}$	$1\frac{3}{8}$
32	9.00	.1160	$2\frac{1}{8}$	$1\frac{3}{8}$
33	9.00	.1130	$2\frac{1}{8}$	$1\frac{3}{8}$
34	9.00	.1110	$2\frac{1}{8}$	$1\frac{3}{8}$
35	9.00	.1100	$2\frac{1}{8}$	$1\frac{3}{8}$
36	9.00	.1065	$2\frac{1}{8}$	$1\frac{3}{8}$
37	9.00	.1040	$2\frac{1}{8}$	$1\frac{3}{8}$
38	9.00	.1015	$2\frac{1}{8}$	$1\frac{3}{8}$
39	9.00	.0995	$2\frac{1}{8}$	$1\frac{3}{8}$
40	9.00	.0980	$2\frac{1}{8}$	$1\frac{3}{8}$
41	9.00	.0960	$2\frac{1}{8}$	$1\frac{3}{8}$
42	10.00	.0935	$2\frac{1}{8}$	$1\frac{3}{8}$
43	10.00	.0890	$2\frac{1}{8}$	$1\frac{3}{8}$
44	10.00	.0860	$2\frac{1}{8}$	$1\frac{3}{8}$
45	10.00	.0820	$2\frac{1}{8}$	$1\frac{3}{8}$
46	10.00	.0810	$2\frac{1}{8}$	$1\frac{3}{8}$
47	10.00	.0785	$2\frac{1}{8}$	$1\frac{3}{8}$
48	12.00	.0760	$2\frac{1}{8}$	$1\frac{3}{8}$
49	12.00	.0730	2	$1\frac{3}{8}$
50	12.00	.0700	$1\frac{1}{8}$	$\frac{3}{8}$
51	12.00	.0670	$1\frac{1}{8}$	$\frac{3}{8}$
52	12.00	.0635	$1\frac{1}{8}$	$\frac{3}{8}$

Can be furnished straight flute if desired.

"DIAMOND" HIGH SPEED TWIST DRILLS**THREE AND FOUR GROOVE****With Taper Shank**

3-groove, T. S. No. 402-B. 4-groove, T. S. No. 402-C.

**With Straight Shanks**

3-groove, S. S. No. 404-B. 4-groove, S. S. No. 404-C.

Diameter, inches	Price Each	Length overall, inches	TAPER SHANK		ST. SHANK Length Shank, inches
			Length Twist, inches	Shank Taper	
1/4	\$ 2.00	6 1/8	2 1/8	No.1	2 1/8
3/8	2.15	6 1/4	2 1/4		2 1/4
1/2	2.25	6 3/8	3 1/8		2 5/8
5/8	2.40	6 1/2	3 1/2		2 5/8
3/4	2.50	6 3/4	3 3/4		2 5/8
7/8	2.65	7	3 7/8		2 5/8
1	2.75	7 1/4	4 1/4		2 5/8
1 1/8	2.90	7 1/2	4 1/2		2 5/8
1 1/4	3.00	7 3/4	4 3/4		2 5/8
1 1/2	3.15	8	4 7/8		3
1 3/4	3.25	8 1/4	4 7/8	No.2	3
1 7/8	3.50	8 1/2	4 1/2		3 1/4
2	3.75	8 3/4	4 3/4		3 1/4
2 1/8	4.00	9	5		3 1/2
2 1/4	4.25	9 1/4	5 1/4		3 1/2
2 1/2	4.65	9 1/2	5 1/2		3 1/2
2 3/4	5.00	9 3/4	5 3/4		3 1/2
2 7/8	5.40	9 7/8	5 7/8		3 1/2
3	5.75	10	6		3 1/2
3 1/8	6.15	10 1/4	6 1/4		3 1/2
3 1/4	6.50	10 1/2	6 1/2	No.3	3 3/4
3 1/2	7.00	10 3/8	6 3/8		3 3/4
3 3/4	7.50	10 3/4	6 3/4		3 3/4
3 7/8	8.00	10 7/8	6 7/8		3 3/4
4	8.50	11	7		3 3/4
4 1/8	9.00	11 1/8	7 1/8		4
4 1/4	9.50	11 1/4	7 1/4		4
4 1/2	10.25	11 1/2	7 1/2		4
4 3/4	11.00	11 3/4	7 3/4		4
4 7/8	11.75	11 7/8	7 7/8		4 1/4
5	12.50	12	8	No.4	4 1/4
5 1/8	13.25	12 1/8	8 1/8		4 1/4
5 1/4	14.00	12 1/4	8 1/4		4 1/4
5 1/2	14.75	12 1/2	8 1/2		4 1/4
5 3/4	15.50	12 3/4	8 3/4		4 1/4
5 7/8	16.25	12 7/8	8 7/8		4 1/4
6	17.00	13	9		4 1/4
6 1/8	17.75	13 1/8	9 1/8		4 1/4
6 1/4	18.50	13 1/4	9 1/4		4 1/4
6 1/2	19.25	13 1/2	9 1/2		4 1/4
6 3/4	20.00	13 3/4	9 3/4	No.4	4 1/4
6 7/8	20.75	13 7/8	9 7/8		4 1/4
7	21.50	14	10		4 1/4
7 1/8	22.25	14 1/8	10 1/8		4 1/4
7 1/4	23.00	14 1/4	10 1/4		4 1/4
7 1/2	23.75	14 1/2	10 1/2		4 1/4
7 3/4	24.50	14 3/4	10 3/4		4 1/4
7 7/8	25.50	14 7/8	10 7/8		4 1/4
8	26.50	15	11		4 1/4
8 1/8	27.50	15 1/8	11 1/8		4 1/4
8 1/4	28.50	15 1/4	11 1/4	No.4	4 1/4
8 1/2	29.50	15 1/2	11 1/2		4 1/4
8 3/4	30.50	15 3/4	11 3/4		4 1/4
8 7/8	31.50	15 7/8	11 7/8		4 1/4
9	32.50	16	12		4 1/4
9 1/8	33.50	16 1/8	12 1/8		4 1/4
9 1/4	34.50	16 1/4	12 1/4		4 1/4
9 1/2					4 1/4
9 3/4					4 1/4
9 7/8					4 1/4

WITH TWO-GROOVED SHANKS
Taper Shank Length**No. 401D**

Dia. inches	Price Each	Length, inches	Length Shank, inches	Dia. inches	Price Each	Length, inches	Length Shank, inches
1/8	\$0.90	3 1/8	2 1/8	1/8	\$ 4.00	10	3 1/2
3/16	.90	4 1/8	2 1/4	3/16	4.40	10 1/4	3 1/2
1/4	.90	5 1/8	2 1/2	1/4	4.75	10 1/2	3 1/2
5/16	.90	5 3/8	2 1/2	5/16	5.15	10 3/4	3 1/2
3/8	.90	5 5/8	2 1/2	3/8	5.50	10 3/4	3 1/2
1/2	1.00	5 7/8	2 1/2	1/2	5.90	10 7/8	3 1/2
5/8	1.10	6 1/8	2 1/2	5/8	6.25	11	3 3/4
3/4	1.20	6 3/4	2 3/8	3/4	6.75	11 1/4	4
7/8	1.30	6 5/8	2 3/8	7/8	7.25	11 1/4	4
1	1.40	6 7/8	2 3/8	1	7.75	11 1/2	4
1 1/8	1.50	6 3/4	2 3/8	1 1/8	8.25	11 3/4	4
1 1/4	1.65	7	2 3/4	1 1/4	8.90	11 3/4	4 1/4
1 1/2	1.75	7 1/4	2 3/4	1 1/2	9.50	12	4 1/4
1 3/4	1.90	7 1/2	2 3/4	1 3/4	10.15	12 1/8	4 1/4
2	2.00	7 3/4	2 3/4	2	10.75	12 1/2	4 1/4
2 1/8	2.15	8	2 3/4	2 1/8	11.50	12 1/2	4 1/4
2 1/4	2.25	8 1/4	3	2 1/4	12.25	12 3/4	4 1/4
2 1/2	2.40	8 1/2	3	2 1/2	13.00	12 3/4	4 1/4
2 3/4	2.50	8 3/4	3	2 3/4	13.75	12 3/4	4 1/4
2 7/8	2.75	9	3 1/4	2 7/8	14.65	12 3/4	4 1/4
3	3.00	9 1/4	3 1/4	3	15.50	12 3/4	4 1/4
3 1/8	3.25	9 1/2	3 1/4	3 1/8	16.40	12 3/4	4 1/4
3 1/4	3.50	9 3/4	3 1/4	3 1/4	17.25	15	5
3 1/2	3.75	9 7/8	3 1/2	3 1/2			

Sixty-fourth sizes take list of next larger size. Larger sizes also furnished. Price on application.

WITH TWO-GROOVED SHANKS
Jobbers' Length**No. 405D**

Dia. inches	Price per Dozen	Length, inches	Length Twist, inches	Dia. inches	Price per Dozen	Length, inches	Length Twist, inches
1/8	\$12.00	2 1/2	1 1/4	1/8	\$10.50	4 3/8	3 3/8
3/16	10.00	2 3/8	1 3/8	3/16	10.50	4 1/2	3 3/8
1/4	9.00	2 1/2	1 1/2	1/4	12.00	4 3/8	3 3/8
5/16	9.00	2 7/8	1 1 1/2	5/16	12.00	4 3/4	3 3/8
3/8	8.50	3	1 1 1/2	3/8	13.50	4 7/8	3 3/8
1/2	8.50	3 1/8	1 1 1/2	1/2	13.50	5	3 3/8
5/8	7.50	3 1/4	2 3/8	5/8	15.00	5 1/8	3 3/8
3/4	7.50	3 3/8	2 3/8	3/4	15.00	5 1/4	3 3/8
7/8	6.50	3 1/2	2 3/8	7/8	17.00	5 3/8	3 3/8
1	7.35	3 5/8	2 3/8	1	17.00	5 1/2	4 1/4
1 1/8	7.35	3 3/4	2 3/8	1 1/8	18.75	5 5/8	4 1/4
1 1/4	7.35	3 7/8	2 3/8	1 1/4	18.75	5 3/4	4 1/4
1 1/2	7.35	4	2 3/4	1 1/2	20.00	5 7/8	4 1/4
1 3/4	9.10	4 1/8	2 3/8	1 3/4	20.00	6	4 1/2
2	9.10	4 1/4	2 3/8	2			

BONDING DRILLS

For drilling Bond wire holes for track circuit signal work.

**No. 508**

Diameter, inches	Length, inches	Length of Shank, inches	Price per Dozen
3/32	3 1/2	1	\$9.10

"DIAMOND" HIGH SPEED DRILLS

TWIST TRACK BITS

With Round, Slabbed Shanks

Fitting Paulers, Buda, Harvey, Francis Reed & Co., No. 18 or 19 and Sheffield Car Co.'s No. 5 Track Drills.



No. 506

Diam. inches	Length, inches	Price Each	Diam. inches	Length, inches	Price Each
1/4	6	\$1.20	3/8	6	\$3.50
3/8	6	1.30	1/2	6	3.70
1/2	6	1.40	5/8	6	3.90
5/8	6	1.50	1	6	4.10
3/4	6	1.55	1 1/4	6	4.30
7/8	6	1.65	1 1/2	6	4.50
1	6	1.70	1 3/4	6	4.75
1 1/4	6	1.80	2	6	5.00
1 1/2	6	1.85	2 1/4	6	5.25
1 3/4	6	1.95	2 1/2	6	5.50
2	6	2.05	2 3/4	6	5.80
2 1/4	6	2.20	3	6	6.10
2 1/2	6	2.30	3 1/4	6	6.40
2 3/4	6	2.40	3 1/2	6	6.70
3	6	2.50	3 3/4	6	7.00
3 1/4	6	2.65	4	6	7.40
3 1/2	6	2.75	4 1/4	6	7.80
3 3/4	6	2.90	4 1/2	6	8.20
4	6	3.00	4 3/4	6	8.60
4 1/4	6	3.15	5	6	9.00
4 1/2	6	3.30			

Shanks on these bits are 2 1/4 inches long and 1/4 inch (.648 exactly) diameter.

TWIST TRACK BITS OR DRILLS

With Taper Square Shanks for Use with Ratchets



No. 507

Diam. inches	Length, inches	Price Each	Diam. inches	Length, inches	Price Each
1/4	5	\$2.50	3/8	7 1/2	\$4.70
3/8	5	2.55	1/2	8	5.00
1/2	5	2.60	5/8	8	5.25
5/8	5	2.65	1	8 1/2	5.50
3/4	6	2.70	1 1/4	8 1/2	5.75
7/8	6 1/4	2.75	1 1/2	8 1/2	6.00
1	6 1/4	2.80	1 3/4	8 1/2	6.30
1 1/4	6 1/4	2.85	2	9	6.70
1 1/2	6 1/4	2.90	2 1/4	9	7.00
1 3/4	6 1/4	2.95	2 1/2	9	7.30
2	6 1/4	3.00	2 3/4	9	7.60
2 1/4	6 1/4	3.10	3	9	7.90
2 1/2	6 1/4	3.20	3 1/4	9	8.25
2 3/4	6 1/4	3.30	3 1/2	9	8.60
3	6 1/4	3.40	3 3/4	9	9.00
3 1/4	6 1/4	3.50	4	9	9.30
3 1/2	6 1/4	3.65	4 1/4	9	9.80
3 3/4	6 1/4	3.80	4 1/2	9	10.20
4	7	4.00	4 3/4	9	10.60
4 1/4	7	4.20	5	9	11.00
4 1/2	7 1/2	4.50			

Shank A is 5/8 inch x 3/8 inch, 1 1/2 inch long; Shank B is 3/4 inch x 1/2 inch, 1 1/4 inch long. Shank "A" is regularly furnished unless otherwise specified.

FLAT TRACK BITS



* No. 505. With Round, Slabbed Shanks

Fitting Chucks on Paulers, Buda, Harvey, Francis Reed's No. 18-19 and Sheffield Car Co.'s No. 5 Track Drills.



† No. 504

Fitting Flat Drill Chucks on Paulers, new style Paulers, Buda Girder and Harvey Track Drills.

Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
1/4	6 1/4	\$0.95	3/8	6 1/4	\$1.45
3/8	6 1/4	.95	1/2	6 1/4	1.50
1/2	6 1/4	1.00	5/8	6 1/4	1.52
5/8	6 1/4	1.00	1	6 1/4	1.55
3/4	6 1/4	1.05	1 1/4	6 1/4	1.60
7/8	6 1/4	1.10	1 1/2	6 1/4	1.65
1	6 1/4	1.10	1 3/4	6 1/4	1.70
1 1/4	6 1/4	1.15	2	6 1/4	1.75
1 1/2	6 1/4	1.20	2 1/4	6 1/4	1.80
1 3/4	6 1/4	1.25	2 1/2	6 1/4	1.85
2	6 1/4	1.30	2 3/4	6 1/4	1.90
2 1/4	6 1/4	1.35	3	6 1/4	1.95
2 1/2	6 1/4	1.40			

* Thickness of Bits is 3/8 inch; Shanks are 2 1/4 inches long and 1/4 inch (.648) diameter.

† Thickness of Bits is 1/2 inch; 1/2 to 1 1/4 inch has No. 1 bead; 1 1/4 inch to 1 3/4 inches has No. 2 bead.

SELF OILING DRILLS



Style 4A



Style 4B



Style 4C

STYLE 4A—This drill can be used in any vertical drill press without making a change. The oil or drilling compound, being delivered into cup by means of a can or tube, will at once find its way to the cutting edge of the drill, and keep it perfectly lubricated.

STYLE 4B—This drill can be used either in a horizontal boring machine or vertical drill press. No change is necessary, except to provide a stop for the short tube leading to the collar, to keep it from revolving with the drill. The oil is conducted to tube, either from an elevated reservoir or pump, and is forced to the point of the drill, flooding it, and assisting it in the removal of chips. Furnished with either straight or taper shanks, any length desired.

STYLE 4C—These drills are specially adapted for use in screw machines and turret lathes. Length must be specified when ordering.

Prices on all of above drills furnished on application.

"NORKA" CHUCKS AND "NORKA" HIGH SPEED TWIST DRILLS**Style of Nos. 10-20-30-40**

These chucks are especially constructed to hold Norka two-grooved high speed drills. Drill is locked in jaws with a clamping nut and will center perfectly.

Number	Holds Drills Size, inches	Fitted with Shank Taper	Price, Each
10	$\frac{1}{4}$ to $\frac{1}{2}$	No. 2, 3 or 4	\$ 5.00
20	$\frac{3}{4}$ to 1	No. 3 or 4	7.50
30	$1\frac{1}{4}$ to $1\frac{3}{8}$	No. 4 or 5	10.00
40	$1\frac{1}{2}$ to 3	No. 5 or 6	20.00

**No. 500**

These drills will stand hard and rough service and are adapted for all kinds of drilling in any class of material.

Fitting "Norka" Chuck No. 10
Shanks $1\frac{3}{8}$ inches long

Diam. inches	Length, inches	Price, Each	Diam. inches	Length, inches	Price, Each
$\frac{1}{4}$	5	\$.95	$\frac{11}{16}$	6	\$1.10
$\frac{3}{8}$	5	.95	$\frac{1}{2}$	6	1.15
$\frac{1}{2}$	$5\frac{1}{2}$	1.00	$\frac{3}{4}$	6	1.20
$\frac{5}{8}$	$5\frac{1}{2}$	1.00	$\frac{7}{8}$	$7\frac{1}{8}$	1.30
$\frac{3}{4}$	6	1.05	..	...	....

Fitting "Norka" Chuck No. 20
Shanks $2\frac{1}{2}$ in. long

Diam. inches	Length, inches	Price Each	Diam. inches	Length, inches	Price, Each
$\frac{11}{16}$	$7\frac{1}{8}$	\$1.40	$\frac{23}{32}$	$8\frac{5}{8}$	\$2.60
$\frac{1}{2}$	$7\frac{3}{8}$	1.50	$\frac{1}{2}$	$8\frac{7}{8}$	2.80
$\frac{1}{2}$	$7\frac{3}{8}$	1.60	$\frac{3}{4}$	$8\frac{7}{8}$	3.00
$\frac{5}{8}$	$7\frac{3}{4}$	1.75	$\frac{7}{8}$	9	3.20
$\frac{3}{4}$	$7\frac{3}{4}$	1.90	$\frac{23}{32}$	9	3.45
$\frac{11}{16}$	$8\frac{1}{8}$	2.05	$\frac{1}{2}$	9	3.75
$\frac{1}{2}$	$8\frac{1}{8}$	2.25	$\frac{3}{4}$	9	4.05
$\frac{5}{8}$	$8\frac{5}{8}$	2.40	1	10	4.35

Fitting "Norka" Chuck No. 30

Diam. inches	Length, inches	Price, Each	Diam. inches	Length, inches	Price, Each
$1\frac{1}{32}$	10	\$4.75	$1\frac{1}{32}$	$12\frac{1}{2}$	\$ 8.40
$1\frac{1}{16}$	$10\frac{1}{2}$	5.10	$1\frac{1}{8}$	$12\frac{3}{8}$	8.80
$1\frac{1}{8}$	$10\frac{1}{2}$	5.45	$1\frac{1}{4}$	$12\frac{3}{8}$	9.20
$1\frac{1}{4}$	11	5.80	$1\frac{1}{2}$	13	9.60
$1\frac{3}{8}$	11	6.20	$1\frac{3}{4}$	13	10.00
$1\frac{1}{2}$	$11\frac{1}{4}$	6.55	$1\frac{7}{8}$	$13\frac{1}{4}$	10.40
$1\frac{5}{8}$	$11\frac{1}{4}$	6.90	$1\frac{1}{2}$	$13\frac{1}{4}$	10.80
$1\frac{3}{4}$	$11\frac{3}{4}$	7.20	$1\frac{7}{8}$	$13\frac{1}{2}$	11.20
$1\frac{7}{8}$	$11\frac{3}{4}$	7.60	$1\frac{3}{4}$	$13\frac{1}{2}$	11.65
$1\frac{1}{2}$	$12\frac{1}{2}$	8.00	$1\frac{3}{8}$	$13\frac{3}{4}$	12.10

Fitting "Norka" Chuck No. 40
Shank $3\frac{1}{2}$ inches long

Diam. inches	Length, inches	Price Each	Diam. inches	Length, inches	Price Each
$1\frac{3}{8}$	$13\frac{3}{4}$	\$12.60	$2\frac{1}{8}$	$15\frac{3}{4}$	\$25.70
$1\frac{1}{2}$	14	13.05	$2\frac{3}{8}$	$16\frac{1}{4}$	26.40
$1\frac{3}{4}$	14	13.60	$2\frac{1}{2}$	$16\frac{1}{4}$	27.10
$1\frac{3}{4}$	$14\frac{1}{4}$	14.10	$2\frac{7}{8}$	$16\frac{3}{4}$	27.80
$1\frac{3}{8}$	$14\frac{1}{4}$	14.55	$2\frac{1}{2}$	$16\frac{3}{4}$	28.50
$1\frac{1}{2}$	$14\frac{1}{2}$	15.00	$2\frac{1}{2}$	$17\frac{1}{4}$	29.20
$1\frac{3}{8}$	$14\frac{1}{2}$	15.50	$2\frac{1}{2}$	$17\frac{1}{4}$	29.90
$1\frac{3}{4}$	$14\frac{3}{4}$	16.00	$2\frac{3}{4}$	$17\frac{1}{2}$	30.60
$1\frac{3}{8}$	$14\frac{3}{4}$	16.55	$2\frac{3}{4}$	$17\frac{1}{2}$	31.30
$1\frac{1}{2}$	$14\frac{3}{4}$	17.10	$2\frac{5}{8}$	$17\frac{3}{4}$	32.00
$1\frac{3}{8}$	$14\frac{3}{4}$	17.65	$2\frac{3}{4}$	$17\frac{3}{4}$	33.00
$1\frac{1}{2}$	$14\frac{3}{4}$	18.20	$2\frac{1}{2}$	$18\frac{1}{4}$	34.00
$2\frac{1}{32}$	$14\frac{3}{4}$	18.85	$2\frac{3}{8}$	$18\frac{1}{4}$	35.00
$2\frac{1}{16}$	$15\frac{1}{4}$	19.50	$2\frac{3}{4}$	$18\frac{3}{4}$	36.00
$2\frac{1}{8}$	$15\frac{1}{4}$	20.15	$2\frac{3}{8}$	$18\frac{3}{4}$	37.00
$2\frac{1}{4}$	$15\frac{1}{4}$	20.80	$2\frac{1}{2}$	$18\frac{3}{4}$	38.00
$2\frac{3}{8}$	$15\frac{1}{4}$	21.50	$2\frac{3}{4}$	$18\frac{3}{4}$	39.00
$2\frac{1}{2}$	$15\frac{1}{4}$	22.20	$2\frac{7}{8}$	$19\frac{1}{4}$	40.00
$2\frac{3}{4}$	$15\frac{1}{4}$	22.90	$2\frac{3}{8}$	$19\frac{1}{4}$	41.25
$2\frac{1}{4}$	$15\frac{3}{4}$	23.60	$2\frac{1}{2}$	$19\frac{1}{4}$	42.50
$2\frac{3}{8}$	$15\frac{3}{4}$	24.30	$2\frac{3}{4}$	$19\frac{1}{4}$	43.75
$2\frac{1}{2}$	$15\frac{3}{4}$	25.00	3	$20\frac{1}{4}$	45.00

64th sizes take list of next larger size.

"NORKA" CHUCKS AND "NORKA" HIGH SPEED DRILLS**Style of Nos. 0, 1, 2, 3, 4**

For holding Norka High Speed Drills with Flat Shank. Drill is securely locked in the jaws with a clamping nut.

Number	Hold Drills, Size, inches	Taper Shank, Number	Price Each
0	$\frac{1}{4}$ to $\frac{1}{2}$	2, 3 or 4	\$ 5.00
1	$\frac{3}{8}$ to 1	3 or 4	7.50
2	$1\frac{1}{4}$ to $1\frac{1}{2}$	4 or 5	10.00
3	$1\frac{3}{4}$ to 2	4 or 5	12.00
4	$2\frac{1}{4}$ to 3	5 or 6	20.00

**No. 501****Fitting "Norka" Chuck No. 0****Shank $2\frac{1}{8}$ inches long**

Diameter, inches	Length, inches	Price Each	Diameter, inches	Length, inches	Price Each
$\frac{1}{4}$	$5\frac{1}{2}$	\$0.95	$\frac{3}{8}$	6	\$1.10
$\frac{5}{16}$	$5\frac{1}{2}$	.95	$\frac{7}{16}$	6	1.15
$\frac{3}{8}$	$5\frac{1}{2}$	1.00	$\frac{1}{2}$	6	1.20
$\frac{7}{16}$	$5\frac{1}{2}$	1.00	$\frac{3}{4}$	$7\frac{1}{8}$	1.30
$\frac{1}{2}$	6	1.05			

Fitting "Norka" Chuck No. 1**Shank $2\frac{1}{8}$ inches long**

Diameter, inches	Length, inches	Price Each	Diameter, inches	Length, inches	Price Each
$\frac{1}{2}$	$7\frac{1}{8}$	\$1.40	$\frac{3}{4}$	$8\frac{5}{8}$	\$2.60
$\frac{5}{8}$	$7\frac{1}{8}$	1.50	$\frac{7}{8}$	$8\frac{7}{8}$	2.80
$\frac{3}{4}$	$7\frac{1}{8}$	1.60	$\frac{1}{2}$	$8\frac{7}{8}$	3.00
$\frac{7}{8}$	$7\frac{3}{4}$	1.75	$\frac{3}{8}$	9	3.20
$\frac{1}{2}$	$7\frac{3}{4}$	1.90	$\frac{1}{4}$	9	3.45
$\frac{1}{2}$	$8\frac{1}{8}$	2.05	$\frac{1}{8}$	9	3.75
$\frac{3}{8}$	$8\frac{1}{8}$	2.25	$\frac{1}{16}$	9	4.05
$\frac{1}{4}$	$8\frac{3}{8}$	2.40	1	10	4.35

Fitting "Norka" Chuck No. 2**Shank $3\frac{1}{4}$ inches long**

Diameter, inches	Length, inches	Price Each	Diameter, inches	Length, inches	Price Each
$1\frac{1}{2}$	10	\$4.75	$1\frac{3}{4}$	$11\frac{3}{4}$	\$ 7.60
$1\frac{1}{4}$	$10\frac{1}{2}$	5.10	$1\frac{1}{2}$	$12\frac{1}{2}$	8.00
$1\frac{3}{8}$	$10\frac{1}{2}$	5.45	$1\frac{1}{4}$	$12\frac{1}{2}$	8.40
$1\frac{1}{2}$	11	5.80	$1\frac{3}{8}$	$12\frac{1}{2}$	8.80
$1\frac{1}{4}$	11	6.20	$1\frac{1}{2}$	$12\frac{1}{2}$	9.20
$1\frac{3}{8}$	$11\frac{1}{4}$	6.55	$1\frac{1}{4}$	13	9.60
$1\frac{1}{2}$	$11\frac{1}{4}$	6.90	$1\frac{3}{8}$	13	10.00
$1\frac{3}{4}$	$11\frac{3}{4}$	7.20	$1\frac{1}{2}$	$13\frac{1}{4}$	10.40

Fitting "Norka" Chuck No. 3**Shank $3\frac{1}{2}$ inches long**

Diameter, inches	Length, inches	Price Each	Diameter, inches	Length, inches	Price Each
$1\frac{1}{2}$	$13\frac{1}{4}$	\$10.80	$1\frac{3}{8}$	$14\frac{1}{4}$	\$14.55
$1\frac{1}{4}$	$13\frac{1}{4}$	11.20	$1\frac{1}{2}$	$14\frac{1}{4}$	15.00
$1\frac{3}{8}$	$13\frac{1}{2}$	11.65	$1\frac{3}{4}$	$14\frac{1}{4}$	15.50
$1\frac{1}{2}$	$13\frac{3}{4}$	12.10	$1\frac{7}{8}$	$14\frac{1}{4}$	16.00
$1\frac{3}{4}$	$13\frac{3}{4}$	12.60	$1\frac{1}{2}$	$14\frac{1}{4}$	16.55
$1\frac{1}{4}$	14	13.05	$1\frac{1}{4}$	$14\frac{1}{4}$	17.10
$1\frac{3}{8}$	14	13.60	$1\frac{3}{8}$	$14\frac{1}{4}$	17.65
$1\frac{1}{2}$	$14\frac{1}{4}$	14.10	2	$14\frac{1}{4}$	18.20

Fitting "Norka" Chuck No. 4**Shank 4 inches long**

Diameter, inches	Length, inches	Price Each	Diameter, inches	Length, inches	Price Each
$2\frac{1}{4}$	$14\frac{1}{4}$	\$18.85	$2\frac{1}{2}$	$17\frac{1}{4}$	\$29.90
$2\frac{1}{2}$	$15\frac{1}{4}$	19.50	$2\frac{3}{8}$	$17\frac{1}{4}$	30.60
$2\frac{3}{8}$	$15\frac{1}{4}$	20.15	$2\frac{1}{2}$	$17\frac{1}{2}$	31.30
$2\frac{1}{2}$	$15\frac{1}{4}$	20.80	$2\frac{3}{8}$	$17\frac{1}{2}$	32.00
$2\frac{3}{8}$	$15\frac{1}{4}$	21.50	$2\frac{1}{2}$	$17\frac{3}{4}$	33.00
$2\frac{1}{2}$	$15\frac{1}{2}$	22.20	$2\frac{3}{4}$	$18\frac{1}{4}$	34.00
$2\frac{3}{8}$	$15\frac{1}{2}$	22.90	$2\frac{1}{2}$	$18\frac{1}{4}$	35.00
$2\frac{1}{2}$	$15\frac{3}{4}$	23.60	$2\frac{3}{4}$	$18\frac{3}{4}$	36.00
$2\frac{3}{8}$	$15\frac{3}{4}$	24.30	$2\frac{3}{8}$	$18\frac{3}{4}$	37.00
$2\frac{1}{2}$	$15\frac{3}{4}$	25.00	$2\frac{1}{2}$	$18\frac{3}{4}$	38.00
$2\frac{3}{8}$	$15\frac{3}{4}$	25.70	$2\frac{3}{8}$	$18\frac{3}{4}$	39.00
$2\frac{1}{2}$	$16\frac{1}{4}$	26.40	$2\frac{3}{4}$	$19\frac{1}{4}$	40.00
$2\frac{3}{8}$	$16\frac{1}{4}$	27.10	$2\frac{3}{8}$	$19\frac{1}{4}$	41.25
$2\frac{1}{2}$	$16\frac{1}{4}$	27.80	$2\frac{1}{2}$	$19\frac{1}{4}$	42.50
$2\frac{3}{8}$	$16\frac{3}{4}$	28.50	$2\frac{3}{8}$	$19\frac{1}{4}$	43.75
$2\frac{1}{2}$	$17\frac{1}{4}$	29.20	3	$20\frac{1}{4}$	45.00

STEEL SOCKETS FOR TAPER SHANK DRILLS



No. 100. Taper Socket

		Entire Length inches	Diam. of Blank End in.	Price Each
No. 1.	Holds $\frac{1}{4}$ to $\frac{19}{32}$ in., inclusive.	7	$1\frac{1}{2}$	\$ 1.20
No. 2.	Holds $\frac{3}{8}$ to $\frac{29}{32}$ in., inclusive.	8	$1\frac{1}{2}$	1.80
No. 3.	Holds $\frac{5}{8}$ to $1\frac{1}{4}$ in., inclusive.	10	$1\frac{1}{2}$	2.50
No. 4.	Holds $1\frac{1}{2}$ to 2 in., inclusive.	13	2	4.00
No. 5.	Holds $2\frac{1}{4}$ to $2\frac{1}{2}$ in., inclusive.	15	$2\frac{1}{2}$	7.50
No. 6.	Holds $3\frac{3}{4}$ to 4 in., inclusive.	18	3	14.00



No. 100 A

No. 1.	With Shank fitted to No. 2 Socket.....	\$ 2.00
No. 1.	With Shank fitted to No. 3 Socket.....	2.50
No. 2.	With Shank fitted to No. 3 Socket.....	2.50
No. 2.	With Shank fitted to No. 4 Socket.....	3.20
No. 3.	With Shank fitted to No. 4 Socket.....	3.20
No. 3.	With Shank fitted to No. 5 Socket.....	3.20
No. 3.	With Shank fitted to No. 6 Socket.....	4.80
No. 4.	With Shank fitted to No. 5 Socket.....	4.80
No. 4.	With Shank fitted to No. 6 Socket.....	4.80
No. 5.	With Shank fitted to No. 6 Socket.....	12.00

STEEL SLEEVES FOR TAPER SHANK DRILLS



No. 100 B

No. 1.	Fitted to No. 2 Socket.....	\$ 1.80
No. 1.	Fitted to No. 3 Socket.....	2.40
No. 2.	Fitted to No. 3 Socket.....	2.40
No. 2.	Fitted to No. 4 Socket.....	3.00
No. 3.	Fitted to No. 4 Socket.....	3.00
No. 3.	Fitted to No. 5 Socket.....	4.40
No. 4.	Fitted to No. 5 Socket.....	4.40
No. 4.	Fitted to No. 6 Socket.....	10.00
No. 5.	Fitted to No. 6 Socket.....	10.00

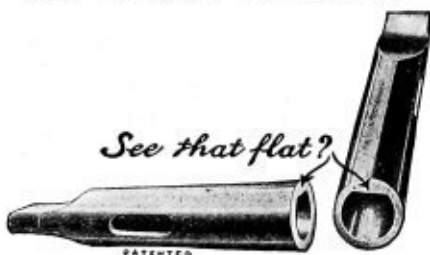
CENTER KEYS OR DRIFTS



Drop forged from special steel, finished and case hardened. Sizes will fit corresponding numbers of socket.

NUMBER	1	2	3	4	5	6
Length, inches.....	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	10	$11\frac{1}{2}$
Thickness, inches.....	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{10}{32}$	$\frac{5}{16}$	$\frac{3}{4}$
Width, inches.....	$\frac{23}{32}$	$\frac{21}{32}$	$\frac{11}{32}$	$\frac{17}{32}$	$\frac{11}{16}$	$\frac{11}{16}$
Price, each.....	\$0.30	\$0.35	\$0.40	\$0.50	\$0.60	\$0.75

THE "USE 'EM UP" DRILL SOCKET



Will put into immediate use drills and reamers with tangs twisted off, by grinding flat surface on the remaining shank. No great accuracy required in doing this work and will give positive drive. Special tools can be made to fit these sockets without the expense of milling a tang.

No.	Fitted to	Price, Each
No. 1	No. 2 Socket	\$ 1.80
No. 1	No. 3 Socket	2.40
No. 2	No. 3 Socket	2.40
No. 2	No. 4 Socket	3.00
No. 3	No. 4 Socket	3.00
No. 3	No. 5 Socket	4.40
No. 4	No. 5 Socket	4.40
No. 4	No. 6 Socket	10.00
No. 5	No. 6 Socket	10.00

We can also furnish this socket in the extension type, same as style No. 100-A at same list prices.

ARMSTRONG AUTOMATIC DRILL DRIFT

The handle or driver is always ready to strike a blow as the spring automatically throws it back into position.



Saves Time and Tools

because it can be operated with one hand, leaving the other to hold the drill, thus preventing the tool from falling upon the work below.



No.	Capacity	Recommended for	Weight	Price, Each	Extra Blades, Each
1-A	No. 1, 2 or 3 Morse Taper	No. 1 or 2	$1\frac{1}{2}$ lbs.	\$1.25	\$0.40
2-A	No. 2, 3 or 4 Morse Taper	No. 2 or 3	$2\frac{1}{4}$ lbs.	1.50	.50
3-A	No. 3, 4 or 5 Morse Taper	No. 3 or 4	4 lbs.	2.00	.65

HAND REAMERS

Jobbers' Set



No. 115 Standard



No. 122 (Threaded End—Self Feeding)

No. 115 furnished unless otherwise specified.

Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Diameter, inches	Price Each	Length, inches	Length of Flute, inches
1/16	\$1.00	3	1 1/2	1 1/2	4.40	12	6 1/2
1/8	1.10	3 1/4	1 3/4	1 1/4	4.50	12 1/4	6 3/4
3/16	1.20	3 1/2	1 3/4	1 1/2	4.60	12 1/2	6 3/4
1/4	1.30	3 3/4	1 3/4	1 3/4	4.70	12 3/4	6 3/4
5/16	1.40	4	1 3/4	1 1/2	4.80	12 1/2	6 3/4
3/8	1.45	4 1/4	1 3/4	1 1/2	4.90	12 1/2	6 3/4
7/16	1.50	4 1/2	1 3/4	1 1/2	5.00	12 1/2	6 3/4
1/2	1.55	4 3/4	1 3/4	1 1/2	5.10	12 1/2	6 3/4
5/8	1.60	5	1 3/4	1 1/2	5.20	12 1/2	6 3/4
3/4	1.70	5 1/4	1 3/4	1 1/2	5.30	12 1/2	6 3/4
7/8	1.75	5 1/2	1 3/4	1 1/2	5.40	12 1/2	6 3/4
1	1.85	5 3/4	1 3/4	1 1/2	5.50	12 1/2	6 3/4
1 1/16	1.90	6	1 3/4	1 1/2	5.60	12 1/2	6 3/4
1 1/8	1.95	6 1/4	1 3/4	1 1/2	5.70	12 1/2	6 3/4
1 1/4	2.00	6 1/2	1 3/4	1 1/2	5.80	12 1/2	6 3/4
1 1/2	2.10	6 3/4	1 3/4	1 1/2	5.90	12 1/2	6 3/4
1 3/4	2.20	7	1 3/4	1 1/2	6.00	12 1/2	6 3/4
1 7/8	2.30	7 1/4	1 3/4	1 1/2	6.10	12 1/2	6 3/4
2	2.40	7 1/2	1 3/4	1 1/2	6.20	12 1/2	6 3/4
2 1/16	2.50	7 3/4	1 3/4	1 1/2	6.30	12 1/2	6 3/4
2 1/8	2.60	8	1 3/4	1 1/2	6.40	12 1/2	6 3/4
2 1/4	2.70	8 1/4	1 3/4	1 1/2	6.50	12 1/2	6 3/4
2 1/2	2.80	8 1/2	1 3/4	1 1/2	6.60	12 1/2	6 3/4
2 3/4	2.90	8 3/4	1 3/4	1 1/2	6.70	12 1/2	6 3/4
3	3.00	9	1 3/4	1 1/2	6.80	12 1/2	6 3/4
3 1/16	3.10	9 1/4	1 3/4	1 1/2	6.90	12 1/2	6 3/4
3 1/8	3.20	9 1/2	1 3/4	1 1/2	7.00	12 1/2	6 3/4
3 1/4	3.30	9 3/4	1 3/4	1 1/2	7.10	12 1/2	6 3/4
3 1/2	3.40	10	1 3/4	1 1/2	7.20	12 1/2	6 3/4
3 3/4	3.50	10 1/4	1 3/4	1 1/2	7.30	12 1/2	6 3/4
4	3.60	10 1/2	1 3/4	1 1/2	7.40	12 1/2	6 3/4
4 1/16	3.70	10 3/4	1 3/4	1 1/2	7.50	12 1/2	6 3/4
4 1/8	3.85	11	1 3/4	1 1/2	7.60	12 1/2	6 3/4
4 1/4	4.00	11 1/4	1 3/4	1 1/2	7.70	12 1/2	6 3/4
4 1/2	4.15	11 1/2	1 3/4	1 1/2	7.80	12 1/2	6 3/4
4 3/4	4.30	11 3/4	1 3/4	1 1/2	7.90	12 1/2	6 3/4
5	4.45	12	1 3/4	1 1/2	8.00	12 1/2	6 3/4
5 1/16	4.60	12 1/4	1 3/4	1 1/2	8.10	12 1/2	6 3/4
5 1/8	4.75	12 1/2	1 3/4	1 1/2	8.20	12 1/2	6 3/4
5 1/4	4.90	12 3/4	1 3/4	1 1/2	8.30	12 1/2	6 3/4
5 1/2	5.05	13	1 3/4	1 1/2	8.40	12 1/2	6 3/4
5 3/4	5.20	13 1/4	1 3/4	1 1/2	8.50	12 1/2	6 3/4

COMMON SENSE EXPANSION REAMERS
(Eccentric Flutes)

No. 129

Diameter, inches	Price Each	Length of Flute, inches	Length Over All, inches
1/16	\$3.20	2 1/4	4 1/2
1/8	3.30	2 1/4	4 1/2
3/16	3.40	2 1/4	5
1/4	3.60	2 1/4	5 1/2
5/16	3.90	3 1/4	5 3/4
3/8	4.30	3 1/4	6 1/4
1/2	4.75	3 1/4	6 3/4
5/8	5.20	4 1/4	7 1/4
3/4	5.70	4 1/4	7 3/4
7/8	6.10	4 1/4	8 1/4
1	6.50	4 1/4	8 1/2

Furnished up to 2 1/2 inch. Price on application.

THREE-GROOVE CHUCKING REAMERS



No. 120K

Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Shank Taper	Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Shank Taper
1/16	\$1.70	7	3	No. 1	1 1/2	\$4.25	13 1/4	8 3/4	No. 3
1/8	1.70	7 1/4	3 1/4		1 1/4	4.40	13 1/4	8 3/4	
3/16	1.70	7 1/2	3 1/2		1 3/8	4.50	13 1/4	8 3/4	
1/4	1.70	7 3/4	3 3/4		1 1/2	4.60	13 1/4	8 3/4	
5/16	1.75	7 3/8	3 3/8		1 1/4	4.70	13 1/4	8 3/4	
3/8	1.80	7 3/4	3 3/4		1 3/8	4.80	13 1/4	8 3/4	
1/2	1.85	7 3/2	3 3/2		1 1/2	4.90	13 1/4	8 3/4	
5/8	1.90	8	3 3/4		1 3/8	5.00	13 1/4	8 3/4	
3/4	1.95	8 1/4	3 3/4		1 1/2	5.10	13 1/4	8 3/4	
7/8	2.00	8 1/2	3 3/4		1 3/8	5.20	13 1/4	8 3/4	
1	2.00	8 3/4	3 3/4		1 1/2	5.30	13 1/4	8 3/4	
1 1/16	2.00	8 3/2	3 3/2		1 3/8	5.40	13 1/4	8 3/4	
1 1/8	2.00	8 3/4	3 3/4		1 1/2	5.50	13 1/4	8 3/4	
1 1/4	2.00	8 3/2	3 3/2		1 3/8	5.60	13 1/4	8 3/4	
1 1/2	2.00	8 3/4	3 3/4		1 1/2	5.70	13 1/4	8 3/4	
1 3/4	2.00	8 3/2	3 3/2		1 3/8	5.80	13 1/4	8 3/4	
2	2.00	8 3/4	3 3/4		1 1/2	5.90	13 1/4	8 3/4	
2 1/16	2.00	8 3/2	3 3/2		1 3/8	6.00	13 1/4	8 3/4	
2 1/8	2.00	8 3/4	3 3/4		1 1/2	6.10	13 1/4	8 3/4	
2 1/4	2.00	8 3/2	3 3/2		1 3/8	6.20	13 1/4	8 3/4	
2 1/2	2.00	8 3/4	3 3/4		1 1/2	6.30	13 1/4	8 3/4	
2 3/4	2.00	8 3/2	3 3/2		1 3/8	6.40	13 1/4	8 3/4	
3	2.00	8 3/4	3 3/4		1 1/2	6.50	13 1/4	8 3/4	
3 1/16	2.00	8 3/2	3 3/2		1 3/8	6.60	13 1/4	8 3/4	
3 1/8	2.00	8 3/4	3 3/4		1 1/2	6.70	13 1/4	8 3/4	
3 1/4	2.00	8 3/2	3 3/2		1 3/8	6.80	13 1/4	8 3/4	
3 1/2	2.00	8 3/4	3 3/4		1 1/2	6.90	13 1/4	8 3/4	
3 3/4	2.00	8 3/2	3 3/2		1 3/8	7.00	13 1/4	8 3/4	
4	2.00	8 3/4	3 3/4		1 1/2	7.10	13 1/4	8 3/4	
4 1/16	2.00	8 3/2	3 3/2		1 3/8	7.20	13 1/4	8 3/4	
4 1/8	2.00	8 3/4	3 3/4		1 1/2	7.30	13 1/4	8 3/4	
4 1/4	2.00	8 3/2	3 3/2		1 3/8	7.40	13 1/4	8 3/4	
4 1/2	2.00	8 3/4	3 3/4		1 1/2	7.50	13 1/4	8 3/4	
4 3/4	2.00	8 3/2	3 3/2		1 3/8	7.60	13 1/4	8 3/4	
5	2.00	8 3/4	3 3/4		1 1/2	7.70	13 1/4	8 3/4	
5 1/16	2.00	8 3/2	3 3/2		1 3/8	7.80	13 1/4	8 3/4	
5 1/8	2.00	8 3/4	3 3/4		1 1/2	7.90	13 1/4	8 3/4	
5 1/4	2.00	8 3/2	3 3/2		1 3/8	8.00	13 1/4	8 3/4	
5 1/2	2.00	8 3/4	3 3/4		1 1/2	8.10	13 1/4	8 3/4	
5 3/4	2.00	8 3/2	3 3/2		1 3/8	8.20	13 1/4	8 3/4	
6	2.00	8 3/4	3 3/4		1 1/2	8.30	13 1/4	8 3/4	
6 1/16	2.00	8 3/2	3 3/2		1 3/8	8.40	13 1/4	8 3/4	
6 1/8	2.00	8 3/4	3 3/4		1 1/2	8.50	13 1/4	8 3/4	
6 1/4	2.00	8 3/2	3 3/2		1 3/8	8.60	13 1/4	8 3/4	
6 1/2	2.00	8 3/4	3 3/4		1 1/2	8.70	13 1/4	8 3/4	
6 3/4	2.00	8 3/2	3 3/2		1 3/8	8.80	13 1/4	8 3/4	
7	2.00	8 3/4	3 3/4		1 1/2	8.90	13 1/4	8 3/4	
7 1/16	2.00	8 3/2	3 3/2		1 3/8	9.00	13 1/4	8 3/4	
7 1/8	2.00	8 3/4	3 3/4		1 1/2	9.10	13 1/4	8 3/4	
7 1/4	2.00	8 3/2	3 3/2		1 3/8	9.20	13 1/4	8 3/4	
7 1/2	2.00	8 3/4	3 3/4		1 1/2	9.30	13 1/4	8 3/4	
7 3/4	2.00	8 3/2	3 3/2		1 3/8	9.40	13 1/4	8 3/4	
8	2.00	8 3/4	3 3/4		1 1/2	9.50	13 1/4	8 3/4	
8 1/16	2.00	8 3/2	3 3/2		1 3/8	9.60	13 1/4	8 3/4	
8 1/8	2.00	8 3/4	3 3/4		1 1/2	9.70	13 1/4	8 3/4	
8 1/4	2.00	8 3/2	3 3/2		1 3/8	9.80	13 1/4	8 3/4	
8 1/2	2.00	8 3/4	3 3/4		1 1/2	9.90	13 1/4	8 3/4	
8 3/4	2.00	8 3/2	3 3/2		1 3/8	10.00	13 1/4	8 3/4	

These Chucking Reamers are furnished with taper or straight shanks. Special lengths made to order.
Prices on Four-Groove Chucking Reamers on application.

TAPER SHANK JOBBERS' REAMERS

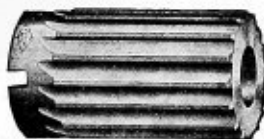


No. 116

Diameter, inches	Length, inches	Length of Flute, inches	Price Each	Shank Taper
1/16	5 1/2	2	\$1.50	No. 1
1/8	5 1/4	2 1/4	1.60	No. 1
3/16	5 1/2	2 1/2	1.70	No. 1
1/4	5 1/4	2 3/4	1.85	No. 1
5/16	6 1/4	3	2.00	No. 1
3/8	6 3/4	3 1/4	2.15	No. 1
1/2	7 1/4	3 1/2	2.30	No. 1
5/8	8 1/4	3 3/4	2.50	No. 1
3/4	8 3/4	4	2.70	No. 1
7/8	8 1/2	4 1/4	2.90	No. 1
1	9 1/4	4 1/2	3.20	No. 1
1 1/16	10	5 1/4	3.50	No. 1
1 1/8	10 1/4	5 1/2	3.80	No. 1
1 1/4	10 1/2	5 3/4	4.10	No. 1
1 1/2	11 1/4	5 1/2	4.40	No. 1
1 3/4	12 1/4	6 1/4	4.70	No. 1
2	12 1/2	6 1/2	5.00	No. 1
2 1/16	12 1/4	6 3/4	5.30	No. 1
2 1/8	13	6 3/4	5.70	No. 1
2 1/4	13 1/4	6 3/4	6.10	No. 1
2 1/2	13 1/2	6 3/4	6.50	No. 1
2 3/4	13 3/4	6 3/4	6.90	No. 1
3	14 1/4	6 3/4	7.30	No. 1
3 1/16	14 1/2	6 3/4	7.70	No. 1
3 1/8	14 3/4	6 3/4	8.00	No. 1
3 1/4	15 1/4	6 3/4	8.40	No. 1
3 1/2	15 1/2	6 3/4	8.80	No. 1
3 3/4	16 1/4	6 3/4	9.20	No. 1
4	16 1/2	6 3/4	9.60	No. 1

We do not carry the No. 116 in stock but can furnish same promptly from factory.

SHELL REAMERS



No. 117—Fluted



No. 117A—Rose

Diameter, inches	Length, inches	Size Hole, inches	Price Each
1/2	2	3/4	\$ 1.40
3/4	2	3/4	1.50
1	2	3/4	1.60
1 1/4	2 1/4	3/4	1.60
1 1/2	2 1/2	3/4	1.60
1 3/4	2 3/4	3/4	1.60
2	3	1 1/2	1.70
2 1/4	3 1/4	1 1/2	1.70
2 1/2	3 1/2	1 1/2	1.80
2 3/4	3 3/4	1 1/2	1.80
3	4	1 1/2	1.80
3 1/4	4 1/4	1 1/2	1.90
3 1/2	4 1/2	1 1/2	2.00
3 3/4	4 3/4	1 1/2	2.20
4	5	2	2.40
4 1/4	5 1/4	2	2.60
4 1/2	5 1/2	2	2.80
4 3/4	5 3/4	2	3.00
5	6	2	3.20
5 1/4	6 1/4	2	3.50
5 1/2	6 1/2	2	3.80
5 3/4	6 3/4	2	4.10
6	7	2	4.40
6 1/4	7 1/4	2	4.70
6 1/2	7 1/2	2	5.00
6 3/4	7 3/4	2	5.20
7	8	2	5.40
7 1/4	8 1/4	2	5.60
7 1/2	8 1/2	2	5.80
7 3/4	8 3/4	2	6.00
8	9	2	6.20
8 1/4	9 1/4	2	6.40
8 1/2	9 1/2	2	6.60
8 3/4	9 3/4	2	6.80
9	10	2	7.00
9 1/4	10 1/4	2	7.30
9 1/2	10 1/2	2	7.60
9 3/4	10 3/4	2	8.00
10	11	2	8.40
10 1/4	11 1/4	2	8.80
10 1/2	11 1/2	2	9.20
10 3/4	11 3/4	2	9.60
11	12	2	9.90
11 1/4	12 1/4	2	10.20
11 1/2	12 1/2	2	10.60
11 3/4	12 3/4	2	11.00
12	13	2	11.50
12 1/4	13 1/4	2	12.00
12 1/2	13 1/2	2	12.50
12 3/4	13 3/4	2	13.00
13	14	2	13.50
13 1/4	14 1/4	2	14.00
13 1/2	14 1/2	2	14.50
13 3/4	14 3/4	2	15.00
14	15	2	15.50
14 1/4	15 1/4	2	16.00
14 1/2	15 1/2	2	17.00
14 3/4	15 3/4	2	18.00
15	16	2	
15 1/4	16 1/4	2	
15 1/2	16 1/2	2	
15 3/4	16 3/4	2	
16	17	2	
16 1/4	17 1/4	2	
16 1/2	17 1/2	2	
16 3/4	17 3/4	2	
17	18	2	
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17 3/4	18 3/4	2	
18	19	2	
18 1/4	19 1/4	2	
18 1/2	19 1/2	2	
18 3/4	19 3/4	2	
19	20	2	
19 1/4	20 1/4	2	
19 1/2	20 1/2	2	
19 3/4	20 3/4	2	
20	21	2	
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25	26	2	
25 1/4	26 1/4	2	
25 1/2	26 1/2	2	
25 3/4	26 3/4	2	
26	27	2	
26 1/4	27 1/4	2	
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FLUTED CHUCKING REAMERS



No. 120F. (Straight Shank)

Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Diameter, inches	Price Each	Length, inches	Length of Flute, inches
1/16	\$0.90	6	1 1/2	1 1/2	11	16	1 1/2
1/8	.95	6	1 1/2	1 3/4	11	16	1 1/2
3/16	1.00	6	1 1/2	1 7/8	11	16	1 1/2
1/4	1.05	6	1 1/2	2	11	16	1 1/2
5/16	1.10	6	1 1/2	2 1/8	11	16	1 1/2
3/8	1.15	6	1 1/2	2 1/4	11	16	1 1/2
7/16	1.20	6	1 1/2	2 3/8	11	16	1 1/2
1/2	1.25	6	1 1/2	2 1/2	11	16	1 1/2
9/16	1.30	6	1 1/2	2 3/4	11	16	1 1/2
5/8	1.35	6	1 1/2	3	11	16	1 1/2
3/4	1.40	6	1 1/2	3 1/8	11	16	1 1/2
7/8	1.45	6	1 1/2	3 1/4	11	16	1 1/2
1	1.50	6	1 1/2	3 3/8	11	16	1 1/2
1 1/16	1.55	6	1 1/2	3 1/2	11	16	1 1/2
1 1/8	1.60	6	1 1/2	3 3/4	11	16	1 1/2
1 1/4	1.65	6	1 1/2	3 7/8	11	16	1 1/2
1 1/2	1.70	6	1 1/2	4	11	16	1 1/2
1 3/4	1.80	6	1 1/2	4 1/8	11	16	1 1/2
2	1.85	6	1 1/2	4 1/4	11	16	1 1/2
2 1/8	1.90	6	1 1/2	4 3/8	11	16	1 1/2
2 1/4	2.00	6	1 1/2	4 1/2	11	16	1 1/2
2 3/8	2.10	6	1 1/2	4 3/4	11	16	1 1/2
2 1/2	2.20	6	1 1/2	4 7/8	11	16	1 1/2
2 3/4	2.30	6	1 1/2	5	11	16	1 1/2
2 7/8	2.40	6	1 1/2	5 1/8	11	16	1 1/2
3	2.50	6	1 1/2	5 1/4	11	16	1 1/2
3 1/8	2.60	6	1 1/2	5 3/8	11	16	1 1/2
3 1/4	2.70	6	1 1/2	5 1/2	11	16	1 1/2
3 3/8	2.80	6	1 1/2	5 3/4	11	16	1 1/2
3 1/2	2.90	6	1 1/2	5 7/8	11	16	1 1/2
3 3/4	3.00	6	1 1/2	6	11	16	1 1/2
3 7/8	3.10	6	1 1/2	6 1/8	11	16	1 1/2
4	3.20	6	1 1/2	6 1/4	11	16	1 1/2
4 1/8	3.30	6	1 1/2	6 3/8	11	16	1 1/2
4 1/4	3.40	6	1 1/2	6 1/2	11	16	1 1/2
4 3/8	3.50	6	1 1/2	6 3/4	11	16	1 1/2
4 1/2	3.60	6	1 1/2	6 7/8	11	16	1 1/2
4 3/4	3.70	6	1 1/2	7	11	16	1 1/2
4 7/8	3.80	6	1 1/2	7 1/8	11	16	1 1/2
5	3.90	6	1 1/2	7 1/4	11	16	1 1/2
5 1/8	4.00	6	1 1/2	7 3/8	11	16	1 1/2
5 1/4	4.10	6	1 1/2	7 1/2	11	16	1 1/2
5 3/8	4.20	6	1 1/2	7 3/4	11	16	1 1/2
5 1/2	4.30	6	1 1/2	7 7/8	11	16	1 1/2
5 3/4	4.40	6	1 1/2	8	11	16	1 1/2
5 7/8	4.50	6	1 1/2	8 1/8	11	16	1 1/2
6	4.60	6	1 1/2	8 1/4	11	16	1 1/2
6 1/8	4.70	6	1 1/2	8 3/8	11	16	1 1/2
6 1/4	4.80	6	1 1/2	8 1/2	11	16	1 1/2
6 3/8	4.90	6	1 1/2	8 3/4	11	16	1 1/2
6 1/2	5.00	6	1 1/2	8 7/8	11	16	1 1/2
6 3/4	5.10	6	1 1/2	9	11	16	1 1/2
6 7/8	5.20	6	1 1/2	9 1/8	11	16	1 1/2
7	5.30	6	1 1/2	9 1/4	11	16	1 1/2
7 1/8	5.40	6	1 1/2	9 3/8	11	16	1 1/2
7 1/4	5.50	6	1 1/2	9 1/2	11	16	1 1/2
7 3/8	5.60	6	1 1/2	9 3/4	11	16	1 1/2
7 1/2	5.70	6	1 1/2	9 7/8	11	16	1 1/2
7 3/4	5.80	6	1 1/2	10	11	16	1 1/2
7 7/8	5.90	6	1 1/2	10 1/8	11	16	1 1/2
8	6.00	6	1 1/2	10 1/4	11	16	1 1/2
8 1/8	6.10	6	1 1/2	10 3/8	11	16	1 1/2
8 1/4	6.20	6	1 1/2	10 1/2	11	16	1 1/2
8 3/8	6.30	6	1 1/2	10 3/4	11	16	1 1/2
8 1/2	6.40	6	1 1/2	10 7/8	11	16	1 1/2
8 3/4	6.50	6	1 1/2	11	11	16	1 1/2
8 7/8	6.60	6	1 1/2	11 1/8	11	16	1 1/2
9	6.70	6	1 1/2	11 1/4	11	16	1 1/2
9 1/8	6.80	6	1 1/2	11 3/8	11	16	1 1/2
9 1/4	6.90	6	1 1/2	11 1/2	11	16	1 1/2
9 3/8	7.00	6	1 1/2	11 3/4	11	16	1 1/2
9 1/2	7.10	6	1 1/2	11 7/8	11	16	1 1/2
9 3/4	7.20	6	1 1/2	12	11	16	1 1/2
9 7/8	7.30	6	1 1/2	12 1/8	11	16	1 1/2
10	7.40	6	1 1/2	12 1/4	11	16	1 1/2
10 1/8	7.50	6	1 1/2	12 3/8	11	16	1 1/2
10 1/4	7.60	6	1 1/2	12 1/2	11	16	1 1/2
10 3/8	7.70	6	1 1/2	12 3/4	11	16	1 1/2
10 1/2	7.80	6	1 1/2	12 7/8	11	16	1 1/2
10 3/4	7.90	6	1 1/2	13	11	16	1 1/2
10 7/8	8.00	6	1 1/2	13 1/8	11	16	1 1/2
11	8.10	6	1 1/2	13 1/4	11	16	1 1/2
11 1/8	8.20	6	1 1/2	13 3/8	11	16	1 1/2
11 1/4	8.30	6	1 1/2	13 1/2	11	16	1 1/2
11 3/8	8.40	6	1 1/2	13 3/4	11	16	1 1/2
11 1/2	8.50	6	1 1/2	13 7/8	11	16	1 1/2
11 3/4	8.60	6	1 1/2	14	11	16	1 1/2
11 7/8	8.70	6	1 1/2	14 1/8	11	16	1 1/2
12	8.80	6	1 1/2	14 1/4	11	16	1 1/2
12 1/8	8.90	6	1 1/2	14 3/8	11	16	1 1/2
12 1/4	9.00	6	1 1/2	14 1/2	11	16	1 1/2
12 3/8	9.10	6	1 1/2	14 3/4	11	16	1 1/2
12 1/2	9.20	6	1 1/2	14 7/8	11	16	1 1/2
12 3/4	9.30	6	1 1/2	15	11	16	1 1/2
12 7/8	9.40	6	1 1/2	15 1/8	11	16	1 1/2
13	9.50	6	1 1/2	15 1/4	11	16	1 1/2
13 1/8	9.60	6	1 1/2	15 3/8	11	16	1 1/2
13 1/4	9.70	6	1 1/2	15 1/2	11	16	1 1/2
13 3/8	9.80	6	1 1/2	15 3/4	11	16	1 1/2
13 1/2	9.90	6	1 1/2	15 7/8	11	16	1 1/2
13 3/4	10.00	6	1 1/2	16	11	16	1 1/2



No. 120E. (Taper Shank)

Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Shank Taper	Diameter, inches	Price Each	Length, inches	Length of Flute, inches	Shank Taper
1/16	\$1.20	6	1 1/2	1" ON	1 1/2	\$3.50	11 1/2	1 1/2	1" ON
1/8	1.20	6	1 1/2		1 3/4	3.70	12	1 1/2	
3/16	1.30	6	1 1/2		1 7/8	3.95	12 1/2	1 1/2	
1/4	1.40	7	1 1/2		2	4.15	12 3/4	1 1/2	
5/16	1.50	7	1 1/2		2 1/8	4.40	12 3/4	1 1/2	
3/8	1.65	7	1 1/2		2 1/4	4.60	12 3/4	1 1/2	
7/16	1.80	8	1 1/2		2 3/8	4.85	13	1 1/2	
1/2	2.00	8	1 1/2		2 1/2	5.10	13 1/2	1 1/2	
9/16	2.20	9	1 1/2		2 3/4	5.30	13 1/2	1 1/2	
5/8	2.40	9	1 1/2		3	5.50	14	1 1/2	
3/4	2.60	9	1 1/2	2" ON	3 1/8	5.70	14	2" ON	
7/8	2.80	9	1 1/2		3 1/4	5.95	14 1/2		1 1/2
1	3.00	9	1 1/2		3 3/8	6.20	14 1/2		1 1/2
1 1/16	3.20	9 1/2	1 1/2		3 1/2	6.50	14 1/2		1 1/2
1 1/8	3.40	9 1/2	1 1/2		3 3/4	6.80	14 1/2		1 1/2
1 1/4	3.60	10	1 1/2		3 7/8	7.10	14 1/2		1 1/2
1 1/2	3.80	10	1 1/2		4	7.40	14 1/2		1 1/2
1 3/4	4.00	10 1/2	1 1/2		4 1/8	7.70	15		1 1/2
2	4.20	10 1/2	1 1/2		4 1/4	8.00	15		1 1/2
2 1/8	4.40	11	1 1/2		4 3/8	8.30	15 1/2		1 1/2
2 1/4	4.60	11	1 1/2	3" ON	4 1/2	8.60	15 1/2	3" ON	
2 3/8	4.80	11 1/2	1 1/2		4 3/4	8.90	15 1/2		1 1/2
2 1/2	5.00	11 1/2	1 1/2		4 7/8	9.20	15 1/2		1 1/2
2 3/4	5.20	12	1 1/2		5	9.50	15 1/2		1 1/2
2 7/8	5.40	12	1 1/2		5 1/8	9.80	15 1/2		1 1/2
3	5.60	12 1/2	1 1/2		5 1/4	10.00	15 1/2		1 1/2
3 1/8	5.80	13	1 1/2	4" ON	5 1/2	10.40	15 1/2	4" ON	
3 1/4	6.00	13	1 1/2		5 3/4	10.80	16		1 1/2
3 3/8	6.20	13 1/2	1 1/2		5 1/2	11.20	16		1 1/2
3 1/2	6.40	13 1/2	1 1/2		5 7/8	11.60	16		1 1/2
3 3/4	6.60	14	1 1/2		6	12.00	16		1 1/2
3 7/8	6.80	14	1 1/2						

TAPER REAMERS



No. 118. Finishing Reamer



No. 118A. Roughing Reamer

No. of Reamer	Length, inches	Length of Flute, inches	Taper	Price Each
0	3 3/4	2 3/4	367 by .252	\$ 1.60
1	5 1/2	3	517 by .369	2.00
2	7	3 1/2	745 by .572	2.60
3	8	4 1/4	989 by .778	3.40
4	9	5 1/4	1,290 by 1.020	4.20
5	10	6 1/4	1,801 by 1.475	6.00
6	12	8 1/2	3,557 by 2.116	12.00
7	16	12	3,773 by 2.750	25.00

AIR DRILL REAMERS

With Taper Shanks



No. 120L

For Boiler Makers, Bridge and Ship Builders

DIAMETER AT			Price Each	Shank Taper	Length, inches	Length of Flute, inches	Taper End, length
A	B	C					
1/4	1/4	1/4	\$2.75	1	7	4	1
1/2	1/2	1/2	2.75	1	7	4	1
3/4	3/4	3/4	2.75	1	7	4	1
1	1	1	2.75	1	7	4	1
1 1/4	1 1/4	1 1/4	2.75	1	7	4	1
1 1/2	1 1/2	1 1/2	2.75	1	7	4	1
1 3/4	1 3/4	1 3/4	2.75	1	7	4	1
2	2	2	2.75	1	7	4	1
2 1/4	2 1/4	2 1/4	2.75	1	7	4	1
2 1/2	2 1/2	2 1/2	2.75	1	7	4	1
2 3/4	2 3/4	2 3/4	2.75	1	7	4	1
3	3	3	2.75	1	7	4	1
3 1/4	3 1/4	3 1/4	2.75	1	7	4	1
3 1/2	3 1/2	3 1/2	2.75	1	7	4	1
3 3/4	3 3/4	3 3/4	2.75	1	7	4	1
4	4	4	2.75	1	7	4	1
4 1/4	4 1/4	4 1/4	2.75	1	7	4	1
4 1/2	4 1/2	4 1/2	2.75	1	7	4	1
4 3/4	4 3/4	4 3/4	2.75	1	7	4	1
5	5	5	2.75	1	7	4	1
5 1/4	5 1/4	5 1/4	2.75	1	7	4	1
5 1/2	5 1/2	5 1/2	2.75	1	7	4	1
5 3/4	5 3/4	5 3/4	2.75	1	7	4	1
6	6	6	2.75	1	7	4	1
6 1/4	6 1/4	6 1/4	2.75	1	7	4	1
6 1/2	6 1/2	6 1/2	2.75	1	7	4	1
6 3/4	6 3/4	6 3/4	2.75	1	7	4	1
7	7	7	2.75	1	7	4	1
7 1/4	7 1/4	7 1/4	2.75	1	7	4	1
7 1/2	7 1/2	7 1/2	2.75	1	7	4	1
7 3/4	7 3/4	7 3/4	2.75	1	7	4	1
8	8	8	2.75	1	7	4	1
8 1/4	8 1/4	8 1/4	2.75	1	7	4	1
8 1/2	8 1/2	8 1/2	2.75	1	7	4	1
8 3/4	8 3/4	8 3/4	2.75	1	7	4	1
9	9	9	2.75	1	7	4	1
9 1/4	9 1/4	9 1/4	2.75	1	7	4	1
9 1/2	9 1/2	9 1/2	2.75	1	7	4	1
9 3/4	9 3/4	9 3/4	2.75	1	7	4	1
10	10	10	2.75	1	7	4	1
10 1/4	10 1/4	10 1/4	2.75	1	7	4	1
10 1/2	10 1/2	10 1/2	2.75	1	7	4	1
10 3/4	10 3/4	10 3/4	2.75	1	7	4	1
11	11	11	2.75	1	7	4	1
11 1/4	11 1/4	11 1/4	2.75	1	7	4	1
11 1/2	11 1/2	11 1/2	2.75	1	7	4	1
11 3/4	11 3/4	11 3/4	2.75	1	7	4	1
12	12	12	2.75	1	7	4	1
12 1/4	12 1/4	12 1/4	2.75	1	7	4	1
12 1/2	12 1/2	12 1/2	2.75	1	7	4	1
12 3/4	12 3/4	12 3/4	2.75	1	7	4	1
13	13	13	2.75	1	7	4	1
13 1/4	13 1/4	13 1/4	2.75	1	7	4	1
13 1/2	13 1/2	13 1/2	2.75	1	7	4	1
13 3/4	13 3/4	13 3/4	2.75	1	7	4	1
14	14	14	2.75	1	7	4	1
14 1/4	14 1/4	14 1/4	2.75	1	7	4	1
14 1/2	14 1/2	14 1/2	2.75	1	7	4	1
14 3/4	14 3/4	14 3/4	2.75	1	7	4	1
15	15	15	2.75	1	7	4	1
15 1/4	15 1/4	15 1/4	2.75	1	7	4	1
15 1/2	15 1/2	15 1/2	2.75	1	7	4	1
15 3/4	15 3/4	15 3/4	2.75	1	7	4	1
16	16	16	2.75	1	7	4	1
16 1/4	16 1/4	16 1/4	2.75	1	7	4	1
16 1/2	16 1/2	16 1/2	2.75	1	7	4	1
16 3/4	16 3/4	16 3/4	2.75	1	7	4	1
17	17	17	2.75	1	7	4	1
17 1/4	17 1/4	17 1/4	2.75	1	7	4	1
17 1/2	17 1/2	17 1/2	2.75	1	7	4	1
17 3/4	17 3/4	17 3/4	2.75	1	7	4	1
18	18	18	2.75	1	7	4	1
18 1/4	18 1/4	18 1/4	2.75	1	7	4	1
18 1/2	18 1/2	18 1/2	2.75	1	7	4	1
18 3/4	18 3/4	18 3/4	2.75	1	7	4	1
19	19	19	2.75	1	7	4	1
19 1/4	19 1/4	19 1/4	2.75	1	7	4	1
19 1/2	19 1/2	19 1/2	2.75	1	7	4	1
19 3/4	19 3/4	19 3/4	2.75	1	7	4	1
20	20	20	2.75	1	7	4	1
20 1/4	20 1/4	20 1/4	2.75	1	7	4	1
20 1/2	20 1/2	20 1/2	2.75	1	7	4	1
20 3/4	20 3/4	20 3/4	2.75	1	7	4	1
21	21	21	2.75	1	7	4	1
21 1/4	21 1/4	21 1/4	2.75	1	7	4	1
21 1/2	21 1/2	21 1/2	2.75	1	7	4	1
21 3/4	21 3/4	21 3/4	2.75	1	7	4	1
22	22	22	2.75	1	7	4	1
22 1/4	22 1/4	22 1/4	2.75	1	7	4	1
22 1/2	22 1/2	22 1/2	2.75	1	7	4	1
22 3/4	22 3/4	22 3/4	2.75	1	7	4	1
23	23	23	2.75	1	7	4	1
23 1/4	23 1/4	23 1/4	2.75	1	7	4	1
23 1/2	23 1/2	23 1/2	2.75	1	7	4	1
23 3/4	23 3/4	23 3/4	2.75	1	7	4	1
24	24	24	2.75	1	7	4	1
24 1/4	24 1/4	24 1/4	2.75	1	7	4	1
24 1/2	24 1/2	24 1/2	2.75	1	7	4	1
24 3/4	24 3/4	24 3/4	2.75	1	7	4	1
25	25	25	2.75	1	7	4	1
25 1/4	25 1/4	25 1/4	2.75	1	7	4	1
25 1/2	25 1/2	25 1/2	2.75	1	7	4	1
25 3/4	25 3/4	25 3/4	2.75	1	7	4	1
26	26	26	2.75	1	7	4	1
26 1/4	26 1/4	26 1/4	2.75	1	7	4	1
26 1/2	26 1/2	26 1/2	2.75	1	7	4	1
26 3/4	26 3/4	26 3/4	2.75	1	7	4	1
27	27	27	2.75	1	7	4	1
27 1/4	27 1/4	27 1/4	2.75	1	7	4	1
27 1/2	27 1/2	27 1/2	2.75	1	7	4	1
27 3/4	27 3/4	27 3/4	2.75	1	7	4	1
28	28	28	2.75	1	7	4	1
28 1/4	28 1/4	28 1/4	2.75	1	7	4	1
28 1/2	28 1/2	28 1/2	2.75	1	7	4	1
28 3/4	28 3/4	28 3/4	2.75	1	7	4	1
29	29	29	2.75	1	7	4	1
29 1/4	29 1/4	29 1/4	2.75	1	7	4	1
29 1/2	29 1/2	29 1/2	2.75	1	7	4	1
29 3/4	29 3/4	29 3/4	2.75	1	7	4	1
30	30	30	2.75	1	7	4	1
30 1/4	30 1/4	30 1/4	2.75	1	7	4	1
30 1/2	30 1/2	30 1/2	2.75	1	7	4	1
30 3/4	30 3/4	30 3/4	2.75	1	7	4	1
31	31	31	2.75	1	7	4	1
31 1/4	31 1/4	31 1/4	2.75	1	7	4	1
31 1/2	31 1/2	31 1/2	2.75	1	7	4	1
31 3/4	31 3/4	31 3/4	2.75	1	7	4	1
32	32	32	2.75	1	7	4	1
32 1/4	32 1/4	32 1/4	2.75	1	7	4	1
32 1/2	32 1/2	32 1/2	2.75	1	7	4	1
32 3/4	32 3/4	32 3/4	2.75	1	7	4	1
33	33	33	2.75	1	7	4	1
33 1/4	33 1/4	33 1/4	2.75	1	7	4	1
33 1/2	33 1/2	33 1/2	2.75	1	7	4	1
33 3/4	33 3/4	33 3/4	2.75	1	7	4	1
34	34	34	2.75	1	7	4	1
34 1/4	34 1/4	34 1/4	2.75	1	7	4	1
34 1/2	34 1/2	34 1/2	2.75	1	7	4	1
34 3/4	34 3/4	34 3/4	2.75	1	7	4	1
35	35	35	2.75	1	7	4	1
35 1/4	35 1/4	35 1/4	2.75	1	7	4	1
35 1/2	35 1/2	35 1/2	2.75	1	7	4	1
35 3/4	35 3/4	35 3/4	2.75	1	7	4	1
36	36	36	2.75	1	7	4	1
36 1/4	36 1/4	36 1/4	2.75	1	7	4	1
36 1/2	36 1/2	36 1/2	2.75	1	7	4	1
36 3/4	36 3/4	36 3/4	2.75	1	7	4	1
37	37	37	2.75	1	7	4	1
37 1/4	37 1/4	37 1/4	2.75	1	7	4	1
37 1/2	37 1/2	37 1/2	2.75	1	7	4	1
37 3/4	37 3/4	37 3/4	2.75	1	7	4	1
38	38	38	2.75	1	7	4	1
38 1/4	38 1/4	38 1/4	2.75	1	7	4	1
38 1/2	38 1/2	38 1/2	2.75	1	7	4	1
38 3/4	38 3/4	38 3/4	2.75	1	7	4	1
39	39	39	2.75	1	7	4	1
39 1/4	39 1/4	39 1/4	2.75	1	7	4	1
39 1/2	39 1/2	39 1/2	2.75	1	7	4	1
39 3/4	39 3/4	39 3/4	2.75	1	7	4	1
40	40	40	2.75	1	7	4	1
40 1/4	40 1/4	40 1/4	2.75	1	7	4	1
40 1/2	40 1/2	40 1/2	2.75	1	7	4	1
40 3/4	40 3/4	40 3/4	2.75	1	7	4	1
41	41	41	2.75	1	7	4	1
41 1/4	41 1/4	41 1/4	2.75	1	7	4	1
41 1/2	41 1/2	41 1/2	2.75	1	7	4	1
41 3/4	41 3/4	41 3/4	2.75	1	7	4	1
42	42	42	2.75	1	7	4	1
42 1/4	42 1/4	42 1/4	2.75	1	7	4	1
42 1/2	42 1/2	42 1/2	2.75	1	7	4	1
42 3/4	42 3/4	42 3/4	2.75	1	7	4	1
43	43	43	2.75	1	7	4	1
43 1/4	43 1/4	43 1/4	2.75	1	7	4	1
43 1/2	43 1/2	43 1/2	2.75	1	7	4	1
43 3/4	43 3/4	43 3/4	2.75	1	7	4	1
44	44	44	2.75	1	7	4	1
44 1/4	44 1/4	44 1/4	2.75	1	7	4	1
44 1/2	44 1/2	44 1/2	2.75	1	7	4	1
44 3/4	44 3/4	44 3/4	2.75	1	7	4	1
45	45	45	2.75	1	7	4	1
45 1/4	45 1/4	45 1/4	2.75	1	7	4	1
45 1/2	45 1/2	45 1/2	2.75	1	7	4	1
45 3/4	45 3/4	45 3/4	2.75	1	7	4	1
46	46	46	2.75	1	7	4	1
46 1/4	46 1/4	46 1/4	2.75	1	7	4	1
46 1/2	46 1/2						

STANDARD TAPER-PIN REAMERS



No. 120D

Taper $\frac{1}{4}$ inch per foot.

Size No.	Diameter at Small End, inches	Length of Flute, inches	Length, inches	Price Each
000	.108	$1\frac{1}{4}$	2	\$1.35
00	.124	$1\frac{1}{4}$	2	1.35
0	.135	$1\frac{1}{4}$	$2\frac{1}{4}$	1.00
1	.146	$1\frac{1}{4}$	$2\frac{1}{2}$	1.00
2	.162	$2\frac{1}{4}$	$3\frac{1}{2}$	1.25
3	.183	$2\frac{1}{4}$	$3\frac{1}{2}$	1.50
4	.208	$2\frac{1}{4}$	4	1.75
5	.243	3	$4\frac{1}{2}$	2.00
6	.279	$3\frac{1}{4}$	5	2.25
7	.331	$4\frac{1}{2}$	6	2.50
8	.398	$5\frac{1}{4}$	$6\frac{1}{2}$	3.00
9	.482	$6\frac{1}{4}$	8	3.50
10	.581	7	9	4.00
11	.706	$8\frac{1}{4}$	$11\frac{1}{4}$	4.75
12	.842	10	$13\frac{1}{4}$	5.50
13	1.069	12	16	6.50
14	1.250	14	$18\frac{1}{4}$	7.25

These reamers have the same taper, and each will overlay in convenient measure the size next smaller.

BIT STOCK TAPER REAMERS



No. 120B

Taper 1 inch to the foot; diameter at large end of flutes is $\frac{1}{16}$ inch larger than nominal size.

Nominal Size, inches	Whole Length, inches	Length of Flute, inches	Price Each	Nominal Size, inches	Whole Length, inches	Length of Flute, inches	Price Each
$\frac{1}{4}$	4-5	$1\frac{1}{2}$	\$0.45	$\frac{11}{16}$	7-8	$4\frac{1}{2}$	\$1.45
$\frac{5}{16}$	4-5	$1\frac{1}{2}$	.50	$\frac{3}{4}$	8	$4\frac{1}{2}$	1.65
$\frac{3}{8}$	5-6	$1\frac{1}{2}$	.55	$\frac{13}{16}$	8	$4\frac{1}{2}$	1.95
$\frac{7}{16}$	5-6	$1\frac{1}{2}$	.60	1	$8\frac{1}{2}$	$4\frac{1}{2}$	2.20
$\frac{1}{2}$	5-6	$1\frac{1}{2}$	.70	$1\frac{1}{8}$	$8\frac{1}{2}$	$4\frac{1}{2}$	2.35
$\frac{9}{16}$	6-7	$1\frac{1}{2}$	.80	$1\frac{1}{4}$	$8\frac{1}{2}$	$4\frac{1}{2}$	2.45
$\frac{5}{8}$	6-7	$1\frac{1}{2}$	.90	$1\frac{3}{8}$	$9\frac{1}{2}$	$4\frac{1}{2}$	2.60
$\frac{11}{16}$	7	$1\frac{1}{2}$	1.05	$1\frac{1}{2}$	$9\frac{1}{2}$	$4\frac{1}{2}$	2.70
$\frac{3}{4}$	7-8	$1\frac{1}{2}$	1.20				

BIT STOCK TAPER REAMER SETS



We furnish "Diamond" Bit Stock Taper Reamers in sets, packed in neat wooden boxes as shown in cut.

Set No. 50 contains 1 each $\frac{1}{4}$ to $\frac{3}{4}$ by sixteenths. Price, per set.....\$6.75

Set No. 50A contains 1 each, $\frac{1}{4}$ to $\frac{1}{2}$ by sixteenths. Price, per set.....\$2.80

LIGHTNING COUNTERSINKS



Bit Brace Shank	ROUND SHANK		CUT		PRICES	
	$\frac{1}{2}$ inch Diameter	$\frac{1}{4}$ inches Diameter	Diam.	Angle	Each	Per Doz.
Fig. 501	Fig. 502	Fig. 503	$\frac{5}{8}$	60°	\$0.50	\$6.75
" 504	" 505	" 506	$\frac{3}{4}$	80°	.50	5.75
" 507	" 508	" 509	$\frac{3}{4}$	60°	.75	8.50
" 511	" 512	" 513	$\frac{3}{4}$	80°	.75	8.50

In ordering state figure No. Bit Stock, Countersinks, metal or wood, and Reamer Bits are listed elsewhere in this book.

CENTER REAMERS
60 Degree Angle

Style A



Style B

No. 120M

Size Cut, inches	Diameter of Shank, inches	STYLE A		STYLE B	
		Price Each	Price Per Doz.	Price Each	Price Per Doz.
$\frac{1}{4}$	$\frac{3}{8}$	\$0.22	\$2.50	\$0.25	\$2.90
$\frac{3}{8}$	$\frac{1}{2}$	.25	2.90	.30	3.25
$\frac{1}{2}$	$\frac{3}{4}$	.30	3.25	.35	3.75
$\frac{3}{4}$	$\frac{1}{2}$	.70	8.00	.75	8.50

Packed $\frac{1}{4}$ to $\frac{3}{4}$ inclusive, one dozen in a box; $\frac{1}{2}$ to $\frac{1}{4}$ inclusive, one-half dozen in a box.

STUBS' BROACHES, OR FIVE-SIDED REAMERS



Size, inches	Price Each	Size, inches	Price Each
$\frac{1}{8}$	\$0.10	$\frac{1}{4}$	\$0.40
$\frac{1}{4}$	.10	$\frac{3}{8}$	.45
$\frac{3}{8}$	.10	$\frac{1}{2}$	.50
$\frac{1}{2}$	.15	$\frac{5}{8}$	.55
$\frac{3}{4}$	.15	$\frac{3}{4}$	.65
$\frac{7}{8}$	.15	$\frac{7}{8}$	.80
1	.15	1	1.10
$1\frac{1}{8}$	.20	$1\frac{1}{8}$	1.25
$1\frac{1}{4}$	.20	$1\frac{1}{4}$	1.50
$1\frac{3}{8}$	.25		
$1\frac{1}{2}$	.25		

LIGHTNING BURRING REAMERS



With Bit Brace or Round Shank

Fig.	Diam. Point	Diam. Large Part	Length Flute, inches	Style Shank	Price Each	Price Per Dozen
544	$\frac{1}{16}$	$\frac{1}{4}$	$1\frac{1}{2}$	Bit Brace	\$1.25	\$14.00
545	$\frac{1}{16}$	$\frac{1}{4}$	$1\frac{1}{2}$	Round	1.25	14.00

BURRING TOOLS



No.	Style Shank	Capacity, Pipe	Price Each
1	Bit Brace	$\frac{1}{2}$ to $\frac{1}{2}$	\$1.00
2	Bit Brace	$\frac{1}{2}$ to 1	1.25
3	$\frac{1}{2}$ or $\frac{3}{4}$ Round Shank	$\frac{1}{2}$ to 1	1.25
4	Bit Brace	1 to 2	3.00
5	T Handle, 20 inches long	1 to 2	3.50
6	T Handle, 20 inches long	$\frac{1}{2}$ to 2	4.00

"DIAMOND" HIGH SPEED REAMERS

Hardened and tempered to give them the greatest wearing qualities. The milling, grinding and other operations are given the utmost care and every reamer is guaranteed accurate to size.

JOBBER'S REAMERS



No. 250. Straight Shank



No. 251. Taper Shank

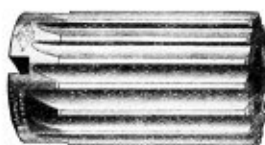
No. 250

Diameter, inches	Price, Each	Length, inches	Length Flute, inches	Diameter, inches	Price, Each	Length, inches	Length Flute, inches
1/4	\$ 3.50	4	2	1 1/4	\$12.75	11 1/2	7 1/2
1/2	3.75	4 1/2	2 1/2	1 1/2	14.25	11 1/2	7 1/2
3/4	3.75	4 1/2	2 1/2	1 3/4	14.25	12	8
1	4.25	4 1/2	2 1/2	1 3/4	15.75	12 1/2	8 1/2
1 1/4	4.25	5	3	1 3/4	15.75	12 1/2	8 1/2
1 1/2	4.75	5 1/2	3 1/2	1 3/4	17.25	12 1/2	8 1/2
1 3/4	4.75	5 1/2	3 1/2	1 3/4	17.25	12 1/2	8 1/2
2	5.25	6	3 1/2	1 3/4	18.75	12 1/2	8 1/2
2 1/4	5.25	6 1/4	3 1/2	1 3/4	18.75	12 1/2	8 1/2
2 1/2	5.75	6 1/2	3 1/2	1 3/4	20.50	12 1/2	8 1/2
2 3/4	5.75	6 1/2	3 1/2	1 3/4	20.50	12 1/2	8 1/2
3	6.25	6 1/2	3 1/2	1 3/4	22.25	12 1/2	8 1/2
3 1/4	6.25	7	3 1/2	1 3/4	22.25	12 1/2	8 1/2
3 1/2	6.75	7 1/2	3 1/2	1 3/4	24.00	13	9
3 3/4	6.75	7 1/2	3 1/2	1 3/4	24.00	13	9
4	7.25	8	4	1 3/4	25.75	13	9
4 1/4	7.25	8 1/2	4 1/2	1 3/4	25.75	13	9
4 1/2	7.75	8 1/2	4 1/2	1 3/4	27.50	13 1/2	9 1/2
4 3/4	7.75	9	4 1/2	1 3/4	27.50	13 1/2	9 1/2
5	8.50	9 1/2	4 1/2	1 3/4	29.50	13 1/2	9 1/2
5 1/4	8.50	10	4 1/2	1 3/4	29.50	13 1/2	9 1/2
5 1/2	9.50	10 1/2	5 1/4	1 3/4	31.50	13 1/2	9 1/2
5 3/4	9.50	10 1/2	5 1/4	1 3/4	31.50	13 1/2	9 1/2
6	10.50	10 1/2	5 1/4	1 3/4	33.50	13 1/2	9 1/2
6 1/4	10.50	10 1/2	5 1/4	1 3/4	33.50	14	10
6 1/2	11.50	11 1/2	6	1 3/4	35.75	14	10
6 3/4	11.50	11 1/2	6	1 3/4	35.75	14	10
7	12.75	11 1/2	6	1 3/4	38.00	14	10
7 1/4				1 3/4	38.00	14	10

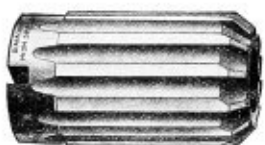
No. 251

Diameter, inches	Price, Each	Length, inches	Length Flute, inches	Shank Taper
1/4	\$ 4.00	5 1/2	2	No. 1
1/2	4.25	5 1/2	2 1/2	No. 1
3/4	4.75	5 1/2	2 1/2	No. 1
1	5.25	6 1/4	2 1/2	No. 1
1 1/4	5.75	6 1/4	3	No. 1
1 1/2	6.25	6 1/4	3 1/2	No. 2
1 3/4	6.75	7 1/2	3 1/2	No. 2
2	7.25	8	3 1/2	No. 2
2 1/4	7.75	8 1/2	4 1/2	No. 2
2 1/2	8.50	8 1/2	4 1/2	No. 2
2 3/4	9.50	9 1/2	4 1/2	No. 2
3	10.50	10	5 1/4	No. 3
3 1/4	11.50	10 1/2	5 1/4	No. 3
3 1/2	12.50	10 1/2	5 1/4	No. 3
3 3/4	13.75	10 1/2	5 1/4	No. 3
4	15.25	11 1/2	6	No. 3
4 1/4	16.75	12 1/2	6 1/4	No. 4
4 1/2	18.25	12 1/2	6 1/4	No. 4
4 3/4	19.75	12 1/2	6 1/4	No. 4
5	21.50	13	6 1/2	No. 4
5 1/4	23.25	13 1/4	6 1/2	No. 4
5 1/2	25.00	13 1/4	6 1/2	No. 4
5 3/4	26.75	13 1/4	6 1/2	No. 4
6	28.50	13 1/4	6 1/2	No. 4
6 1/4	30.50	14 1/4	6 1/2	No. 5
6 1/2	32.50	14 1/4	6 1/2	No. 5
6 3/4	34.50	15	7	No. 5
7	36.75	15	7	No. 5
7 1/4	39.00	15	7	No. 5

SHELL REAMERS



No. 260. Fluted



No. 262. Rose

Diameter, inches	Price, Each	Length, inches	Size Hole, inches	Fitting, Arbor Number
1/2	\$ 3.25	2 1/2	1/4	3
3/4	3.40	2 1/2	1/4	3
1	3.55	2 1/2	1/4	3
1 1/4	3.70	2 1/2	3/8	4
1 1/2	3.85	2 1/2	3/8	4
1 3/4	4.00	2 1/2	3/8	5
2	4.25	2 1/2	3/8	5
2 1/4	4.50	2 1/2	3/8	5
2 1/2	4.75	2 1/2	3/8	6
2 3/4	5.00	2 1/2	3/8	6
3	5.25	2 1/2	3/8	6
3 1/4	5.50	2 1/2	3/8	6
3 1/2	5.75	2 1/2	3/8	6
3 3/4	6.00	2 1/2	3/8	6
4	6.50	3	3/4	7
4 1/4	7.00	3	3/4	7
4 1/2	7.50	3	3/4	7
4 3/4	8.25	3	3/4	7
5	9.00	3	3/4	7
5 1/4	9.75	3 1/2	1	8
5 1/2	10.50	3 1/2	1	8
5 3/4	11.25	3 1/2	1	8
6	12.00	3 1/2	1	8
6 1/4	12.75	3 1/2	1 1/4	9
6 1/2	13.50	3 1/2	1 1/4	9
6 3/4	14.25	3 1/2	1 1/4	9
7	15.00	3 1/2	1 1/4	9
7 1/4	15.75	3 1/2	1 1/4	9
7 1/2	16.50	3 1/2	1 1/4	9
7 3/4	17.25	3 1/2	1 1/4	9
8	18.00	3 1/2	1 1/4	9
8 1/4	18.75	3 1/2	1 1/4	9
8 1/2	19.50	3 1/2	1 1/4	9
8 3/4	20.50	4	1 1/2	10
9	21.75	4	1 1/2	10
9 1/4	23.00	4	1 1/2	10
9 1/2	24.25	4	1 1/2	10

Larger sizes on application.

Arbors for shell reamers listed and illustrated elsewhere in this book.

DIAMOND HIGH SPEED REAMERS

CHUCKING REAMERS

With Taper Shanks



No. 262, Fluted



No. 264, Rose

Diameter, inches	Price Each	Length, inches	LENGTH FLUTE, INCHES		Shank Taper
			No. 262	No. 264	
1/4	\$ 3.50	6	7/8	1 1/2	No. 1
3/8	3.75	6	7/8	1 1/2	
1/2	3.75	6	7/8	1 1/2	
5/8	4.25	6	7/8	1 1/2	
3/4	4.25	7	1	1 3/4	
7/8	4.75	7	1	1 3/4	
1	4.75	7	1	1 3/4	
1 1/8	5.25	7	1	1 3/4	
1 1/4	5.25	8	1 1/8	2	
1 1/2	5.75	8	1 1/8	2	
1 3/4	5.75	8	1 1/8	2	No. 2
2	6.25	8	1 1/8	2	
2 1/8	6.25	9	1 1/4	2 1/4	
2 1/4	6.75	9	1 1/4	2 1/4	
2 1/2	6.75	9	1 1/4	2 1/4	
2 3/4	7.25	9	1 1/4	2 1/4	
3	7.25	9 1/2	1 3/8	2 1/2	
3 1/8	8.00	9 1/2	1 3/8	2 1/2	
3 1/4	8.00	9 1/2	1 3/8	2 1/2	
3 1/2	9.00	9 1/2	1 3/8	2 1/2	
3 3/4	9.00	10	1 1/2	2 5/8	No. 3
4	10.00	10	1 1/2	2 5/8	
4 1/8	10.00	10	1 1/2	2 5/8	
4 1/4	11.00	10	1 1/2	2 5/8	
4 1/2	11.00	10 1/2	1 5/8	2 3/4	
4 3/4	12.25	10 1/2	1 5/8	2 3/4	
5	12.25	10 1/2	1 5/8	2 3/4	
5 1/8	13.50	10 1/2	1 5/8	2 3/4	
5 1/4	13.50	11	1 3/4	2 7/8	
5 1/2	14.75	11	1 3/4	2 7/8	
5 3/4	14.75	11	1 3/4	2 7/8	No. 4
6	16.25	11	1 3/4	2 7/8	
6 1/8	16.25	11 1/2	1 7/8	3	
6 1/4	18.00	11 1/2	1 7/8	3	
6 1/2	19.75	12	2	3 1/4	
6 3/4	21.50	12	2	3 1/4	
7	23.25	12 1/2	2 1/8	3 1/2	
7 1/8	25.00	12 1/2	2 1/8	3 1/2	
7 1/4	26.75	13	2 1/4	3 3/4	
7 1/2	28.50	13	2 1/4	3 3/4	
7 3/4	30.50	13 1/2	2 3/8	4	No. 5
8	32.50	13 1/2	2 3/8	4	
8 1/8	34.50	14	2 1/2	4 1/4	
8 1/4	36.75	14	2 1/2	4 1/4	
8 1/2	39.00	14	2 1/2	4 1/4	

Larger Sizes Quoted on Application

CHUCKING REAMERS

With Straight Shanks



No. 263, Fluted



No. 265, Rose

Diameter, inches	Price Each	Length, inches	LENGTH FLUTE, INCHES	
			No. 263	No. 265
1/4	\$ 3.00	6	7/8	1 1/2
3/8	3.25	6	7/8	1 1/2
1/2	3.25	6	7/8	1 1/2
5/8	3.75	6	7/8	1 1/2
3/4	3.75	7	1	1 3/4
7/8	4.25	7	1	1 3/4
1	4.25	7	1	1 3/4
1 1/8	4.75	7	1	1 3/4
1 1/4	4.75	8	1 1/8	2
1 1/2	5.25	8	1 1/8	2
1 3/4	5.25	8	1 1/8	2
2	5.75	8	1 1/8	2
2 1/8	5.75	9	1 1/4	2 1/4
2 1/4	6.25	9	1 1/4	2 1/4
2 1/2	6.25	9	1 1/4	2 1/4
2 3/4	6.75	9	1 1/4	2 1/4
3	6.75	9 1/2	1 3/8	2 1/2
3 1/8	7.25	9 1/2	1 3/8	2 1/2
3 1/4	7.25	9 1/2	1 3/8	2 1/2
3 1/2	8.00	9 1/2	1 3/8	2 1/2
3 3/4	8.00	10	1 1/2	2 5/8
4	9.00	10	1 1/2	2 5/8
4 1/8	9.00	10	1 1/2	2 5/8
4 1/4	10.00	10	1 1/2	2 5/8
4 1/2	10.00	10 1/2	1 5/8	2 3/4
4 3/4	11.25	10 1/2	1 5/8	2 3/4
5	11.25	10 1/2	1 5/8	2 3/4
5 1/8	12.50	10 1/2	1 5/8	2 3/4
5 1/4	12.50	11	1 3/4	2 7/8
5 1/2	13.75	11	1 3/4	2 7/8
5 3/4	13.75	11	1 3/4	2 7/8
6	15.25	11	1 3/4	2 7/8
6 1/8	15.25	11 1/2	1 7/8	3
6 1/4	17.00	11 1/2	1 7/8	3
6 1/2	18.75	12	2	3 1/4
6 3/4	20.50	12	2	3 1/4
7	22.25	12 1/2	2 1/8	3 1/2
7 1/8	24.00	12 1/2	2 1/8	3 1/2
7 1/4	25.75	13	2 1/4	3 3/4
7 1/2	27.50	13	2 1/4	3 3/4
7 3/4	29.50	13 1/2	2 3/8	4
8	31.50	13 1/2	2 3/8	4
8 1/8	33.50	14	2 1/2	4 1/4
8 1/4	35.75	14	2 1/2	4 1/4
8 1/2	38.00	14	2 1/2	4 1/4

Larger Sizes Quoted on Application

DIAMOND HIGH-SPEED REAMERS

THREE-GROOVE CHUCKING REAMERS



No. 266

Diameter, inches	Price Each	Length, inches	Length Flute, inches	Shank Taper
1/4	\$ 4.00	5 3/8	2	No. 1
5/16	4.25	5 1/2	2 1/4	No. 1
3/8	4.75	5 3/4	2 1/2	No. 1
7/16	5.25	6 1/8	2 3/4	No. 1
1/2	5.75	6 1/4	3	No. 1
5/8	6.25	6 3/4	3 1/4	No. 1
3/4	6.75	7 1/8	3 1/2	No. 2
7/8	7.25	8	3 3/8	No. 2
1	7.75	8 3/4	4 1/8	No. 2
1 1/16	8.50	8 1/2	4 1/4	No. 2
1 1/8	9.50	9 1/8	4 3/8	No. 2
1 1/4	10.50	10	5 1/8	No. 3
1 1/2	11.50	10 3/4	5 1/4	No. 3
1 5/8	12.50	10 3/4	5 3/8	No. 3
1 3/4	13.75	10 3/4	5 1/2	No. 3
1 7/8	15.25	11 1/8	6	No. 3
2	16.75	12 1/8	6 1/8	No. 4
2 1/16	18.25	12 1/4	6 1/4	No. 4
2 1/8	19.75	12 1/2	6 3/8	No. 4
2 1/4	21.50	13	6 1/2	No. 4
2 1/2	23.25	13 1/8	6 1/2	No. 4
2 3/8	25.00	13 1/4	6 1/2	No. 4
2 1/2	26.75	13 3/8	6 1/2	No. 4
2 5/8	28.50	13 1/2	6 3/4	No. 4
2 3/4	30.50	14 1/8	6 3/4	No. 5
2 7/8	32.50	14 1/4	6 3/4	No. 5
3	34.50	15	7	No. 5
3 1/16	36.75	15	7	No. 5
3 1/8	39.00	15	7	No. 5
3 1/4	41.75	15 1/2	7 1/4	No. 5
3 1/2	44.50	15 1/2	7 1/4	No. 5
3 3/8	47.25	15 1/2	7 1/4	No. 5
3 1/2	50.00	15 1/2	7 1/4	No. 5
3 5/8	53.25	16	7 1/2	No. 5
3 3/4	56.50	16	7 1/2	No. 5
3 7/8	59.75	16	7 1/2	No. 5
4	63.00	16	7 1/2	No. 5
4 1/16	66.25	16 1/2	7 3/4	No. 5
4 1/8	69.50	16 1/2	7 3/4	No. 5
4 1/4	72.75	16 1/2	7 3/4	No. 5
4 1/2	76.00	16 1/2	7 3/4	No. 5
4 3/8	79.25	17	8	No. 5
4 1/2	82.50	17	8	No. 5
4 5/8	86.25	17	8	No. 5
5	90.00	17	8	No. 5

32nd sizes take list of next larger size.

BRIDGE BUILDERS' REAMERS



No. 268, Taper Shank



No. 268A, Straight Shank

No. 268

Diameter, inches			Length, inches	Length of Flute, inches	Length of Taper End, inches	Price Each	Shank Taper
A	B	C					
1/4	1/4	3/16	6 3/8	3 3/8	1	\$ 3.00	1
5/16	5/16	3/16	6 3/4	3 3/4	1	3.25	1
3/8	3/8	3/8	7 1/4	4	1	3.50	1
7/16	7/16	3/8	8 1/4	4 1/2	1 1/8	3.75	1 1/2
1/2	1/2	1/2	9	5 1/4	2	4.00	2
5/8	5/8	5/8	10	5 3/4	2 1/2	4.25	2 1/2
3/4	3/4	3/4	11	6 1/4	2 3/4	4.50	3
7/8	7/8	7/8	12	6 3/4	3	4.75	3
1	1	1	12	7 1/8	3	5.00	3
1 1/16	1 1/16	1 1/16	12	7 1/8	3	5.25	3
1 1/8	1 1/8	1 1/8	12	7 1/8	3	5.50	3
1 1/4	1 1/4	1 1/4	12	7 1/8	3	6.00	3
1 1/2	1 1/2	1 1/2	12	7 1/8	3	6.50	3
1 5/8	1 5/8	1 5/8	12	7 1/8	3	7.00	3
1 3/4	1 3/4	1 3/4	12	7 1/8	3	7.50	3
2	2	2	13	7 1/8	3	8.00	3
2 1/16	2 1/16	2 1/16	13	7 1/8	3	8.75	4
2 1/8	2 1/8	2 1/8	13	7 1/8	3	9.50	4
2 1/4	2 1/4	2 1/4	13	7 1/8	3	10.50	4
2 1/2	2 1/2	2 1/2	13	7 1/8	3	12.00	4
2 3/8	2 3/8	2 3/8	13	7 1/8	3	14.00	4

No. 268A

Diameter, inches			Length, inches	Length of Flute, inches	Length of Taper End, inches	Price Each
A	B	C				
1/4	1/4	3/16	4 1/4	2 3/4	1	\$ 2.50
5/16	5/16	3/16	4 3/4	3	1	2.70
3/8	3/8	3/8	5 1/2	3 1/4	1	2.90
7/16	7/16	3/8	6 1/2	4	1 1/2	3.10
1/2	1/2	1/2	8 1/8	5 1/4	2	3.30
5/8	5/8	5/8	9 1/8	6 1/4	2 1/2	3.50
3/4	3/4	3/4	10 1/4	7 1/8	3	3.70
7/8	7/8	7/8	10 1/2	7 1/8	3	3.90
1	1	1	10 3/4	7 1/8	3	4.10
1 1/16	1 1/16	1 1/16	10 3/4	7 1/8	3	4.40
1 1/8	1 1/8	1 1/8	10 3/4	7 1/8	3	4.70
1 1/4	1 1/4	1 1/4	10 3/4	7 1/8	3	5.00
1 1/2	1 1/2	1 1/2	10 3/4	7 1/8	3	5.30
1 5/8	1 5/8	1 5/8	10 3/4	7 1/8	3	5.85
1 3/4	1 3/4	1 3/4	10 3/4	7 1/8	3	6.40
2	2	2	10 3/4	7 1/8	3	6.95
2 1/16	2 1/16	2 1/16	10 3/4	7 1/8	3	7.50
2 1/8	2 1/8	2 1/8	10 3/4	7 1/8	3	8.25
2 1/4	2 1/4	2 1/4	10 3/4	7 1/8	3	9.00
2 1/2	2 1/2	2 1/2	10 3/4	7 1/8	3	10.00
2 3/8	2 3/8	2 3/8	10 3/4	7 1/8	3	11.00

McCROSKY ADJUSTABLE REAMERS

NEW STYLE REAMERS



Hand Reamer



Machine Reamer

Blades of special length and shanks hardened and ground.

Size	HAND		MACHINE		
	Length, inches	Price Each	Length, inches	Price, Morse Taper	Price Straight
1 1/4	10	\$ 6.45	11	\$ 6.60	\$ 7.26
1 1/8	10	6.85	11	6.90	7.59
1 3/8	10	7.35	12	7.20	7.92
1 1/2	10	7.85	12	7.50	8.25
1 5/8	11	8.40	12	7.90	8.70
1 3/4	11	8.95	13	8.15	9.00
1 7/8	11	9.50	13	8.35	9.27
2	11	10.00	13	8.55	9.53
2 1/8	12	10.55	14	8.80	9.75
2 1/4	12	11.05	14	9.10	10.15
2 3/8	12	11.60	14	9.35	10.43
2 1/2	12	12.10	14 1/2	9.55	10.75
2 5/8	13	12.65	14 1/2	9.80	11.05
2 3/4	13	13.20	14 1/2	10.10	11.40
2 7/8	13	13.75	15	10.45	11.90
3	13	14.25	15	10.80	12.20
2 1/4	14	14.80	15	11.10	12.55
2 5/8	14	15.30	15	11.30	12.83
2 3/4	14	15.85	15	11.60	13.20
2 7/8	14	16.40	15	11.90	13.55
3	15	16.90	15 1/2	12.45	14.13
2 1/8	15	17.40	15 1/2	13.10	14.83
2 3/8	15	17.90	15 1/2	13.75	15.55
2 1/2	15	18.40	15 1/2	14.45	16.30
2 5/8	15	18.90	15 1/2	15.10	16.95
2 3/4	16	19.40	15 1/2	15.75	17.70
2 7/8	16	19.90	16	16.45	18.45
3	16	20.40	16	17.10	19.13
3 1/4	16	20.90	16	17.75	19.83

For larger sizes add 50c to list for each 1/8 inch in size. If high speed blades are desired add 10% to list.

CONSTRUCTION



Blade is held rigid and drawn firmly down against seat by outside and inside collars. Adjusted by releasing rear collar and moving up front collar. Simple and rigid in construction with ample chip clearance. Standard size can be maintained through years of service. Blades easily renewed. High speed blades furnished if desired.

OLD STYLE REAMERS



Hand Reamer



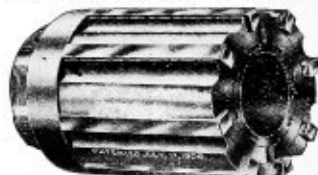
Machine Reamer

Made only in sizes up to 1 1/8 inches because in larger sizes the New Style Reamer is superior. The Old Style Reamer, however, gives better satisfaction in the smaller sizes.

Size	HAND	MACHINE	
	Price Each	Price, Straight Shank	Price, Morse Taper Shank
3/4	\$5.40	.....	.....
1 1/8	5.45	.....	.....
7/8	5.50	\$5.10	\$5.61
1 1/8	5.55	5.20	5.72
1 1/4	5.65	5.35	5.88
1 1/2	5.80	5.60	6.16
1 3/8	5.95	5.85	6.43
1 1/2	6.20	6.10	6.71

For high speed blades add 10% to list prices.

McCROSKY SHELL REAMER



Size	Price	Size	Price
2 1/2	\$10.75	3 1/8	\$17.00
2 3/8	11.00	3 3/8	17.50
2 5/8	11.50	3 1/2	18.00
2 3/4	12.00	3 5/8	18.50
2 7/8	12.50	3 7/8	19.00
2 15/16	13.00	3 7/4	19.50
2 15/16	13.50	3 11/8	20.00
3	14.00	3 11/4	20.50
3 1/8	14.50	3 11/2	21.00
3 1/4	15.00	3 7/8	21.50
3 3/8	15.50	3 15/8	22.00
3 1/2	16.00	4	22.50
3 3/4	16.50	.....	.....

ARBORS OF SHELL REAMERS

No. of Arbor	Size of Reamer	Price		Length
		Straight Shank	Morse Taper	
20	2 1/2 to 2 11/16	\$2.65	\$3.90	14
21	2 3/4 to 2 13/16	2.80	4.05	14 1/2
22	3 to 3 1/16	3.50	4.95	15
23	3 1/8 to 3 1/4	4.15	5.60	16
24	3 3/4 to 3 7/8	5.27	6.72	17
25	3 15/16 to 4 1/16	6.38	7.83	18

In ordering give arbor number and state whether straight or Morse taper shank is desired.



MILLING CUTTERS, CARBON STEEL AND HIGH SPEED STEEL

All Cutters of $\frac{3}{4}$ -inch face and over have teeth of a spiral form. Cutters varying from the following list are made to order of any required size. When any Cutter or combination of Cutters can be made to answer, *It Is Cheaper* to order them than to have special sizes made.

Special Catalog of High Speed Cutters on request.

No.	Diameter, Inches	Width of Face, Inches	Size of Hole, Inches	PRICE, EACH		No.	Diameter, Inches	Width of Face, Inches	Size of Hole, Inches	PRICE, EACH	
				Carbon	High Speed					Carbon	High Speed
M-10	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	\$ 1.75	\$ 2.85	M-87	$\frac{3}{16}$	$\frac{1}{2}$	1	\$ 2.75	\$ 4.40
M-11	$\frac{1}{2}$	1	$\frac{3}{8}$	2.50	4.55	M-88	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.15	5.45
M-12	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.30	5.80	M-89	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.30	5.75
M-13	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.30	1.05	M-90	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.45	6.05
M-14	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.30	1.10	M-91	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.65	6.45
M-15	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.40	1.20	M-92	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.85	6.80
M-16	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.50	1.55	M-93	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.25	7.70
M-17	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.60	1.65	M-94	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.35	8.25
M-18	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.70	1.80	M-95	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.15	9.40
M-19	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.80	3.00	M-96	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.60	10.00
M-20	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.90	3.20	M-97	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.00	11.30
M-21	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.00	3.45	M-98	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.40	12.30
M-22	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.10	3.55	M-99	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.90	13.80
M-23	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.20	3.80	M-100	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.40	15.35
M-24	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.30	4.00	M-101	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.15	16.70
M-25	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.40	4.15	M-102	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	9.15	19.30
M-26	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.60	4.55	M-103	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	10.40	22.20
M-27	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.75	4.85	M-104	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	11.90	26.20
M-28	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.90	5.15	M-105	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	12.00	3.80
M-29	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.10	5.65	M-106	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	2.50	4.55
M-30	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.40	6.30	M-107	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	2.90	5.35
M-31	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.70	6.90	M-108	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.50	6.15
M-32	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.90	7.35	M-109	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.90	6.85
M-33	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.10	7.85	M-110	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.90	6.85
M-34	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.25	8.20	M-111	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.10	7.25
M-35	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.50	8.80	M-112	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.30	7.65
M-36	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.00	9.90	M-113	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.50	8.05
M-37	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.50	11.00	M-114	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.70	8.45
M-38	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.30	1.20	M-115	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.70	8.45
M-39	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.50	1.50	M-116	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.15	9.30
M-40	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.60	1.70	M-117	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.65	10.25
M-41	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.80	1.90	M-118	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.65	10.25
M-42	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.85	3.20	M-119	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.25	11.60
M-43	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.90	3.30	M-120	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.25	11.60
M-44	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.00	3.55	M-121	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.65	12.70
M-45	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.10	3.90	M-122	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.65	12.70
M-46	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.10	5.35	M-123	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.05	13.70
M-47	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.25	5.50	M-124	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.05	13.70
M-48	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.40	6.10	M-125	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.45	14.85
M-49	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.75	6.80	M-126	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.45	14.85
M-50	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.00	7.40	M-127	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.40	17.20
M-51	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.20	7.95	M-128	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	9.00	19.10
M-52	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.60	9.00	M-129	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	10.00	21.55
M-53	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.00	10.00	M-130	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	11.00	23.95
M-54	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.50	11.20	M-131	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	11.00	23.95
M-55	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	6.00	12.65	M-132	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	13.50	28.95
M-56	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	7.40	15.30	M-133	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	13.50	28.95
M-57	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	10.00	19.80	M-134	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	15.50	34.45
M-58	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.30	4.05	M-135	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	9.00	19.10
M-59	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.50	4.35	M-136	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	15.50	34.45
M-60	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.85	4.95	M-137	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.35	6.20
M-61	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.35	2.35	M-138	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.35	6.20
M-62	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.60	2.75	M-139	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.75	6.90
M-63	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	1.85	2.90	M-140	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	3.75	6.90
M-64	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.10	3.55	M-141	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.10	7.50
M-65	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.25	3.85	M-142	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.10	7.50
M-66	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.40	4.10	M-143	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.40	8.15
M-67	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.55	4.40	M-144	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.40	8.15
M-68	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.70	4.70	M-145	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.60	8.60
M-69	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	2.85	4.95	M-146	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.60	8.60
M-70	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.00	5.20	M-147	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.85	9.10
M-71	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.20	5.75	M-148	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	4.85	9.10
M-72	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	3.60	6.35	M-149	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.10	9.60
M-73	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.00	7.20	M-150	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.10	9.60
M-74	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.30	7.85	M-151	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.50	10.50
M-75	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.60	8.45	M-152	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	5.50	10.50
M-76	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	4.70	9.00	M-153	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.00	11.55
M-77	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.20	10.35	M-154	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.00	11.55
M-78	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.40	11.20	M-155	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.60	13.00
M-79	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	5.90	12.50	M-156	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	6.60	13.00
M-80	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	6.40	13.80	M-157	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.25	14.60
M-81	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	7.80	16.90	M-158	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	7.25	14.60
M-82	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	10.80	22.15	M-159	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.00	16.30
M-83	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	1.45	2.65	M-160	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.00	16.30
M-84	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	1.70	3.10	M-161	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.75	18.00
M-85	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	2.05	3.65	M-162	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	8.75	18.00
M-86	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	2.40	4.25						

END MILLS AND SPIRAL END MILLS



Always
state
whether
Right or
Left
Hand is
wanted.

Note—These drills can be fitted with Morse taper.

Diameter	No. of B. & S. Taper	Length of Cut, inches	Whole Length, inches	PRICE EACH	
				Carbon	High Speed
1/4	4	3/4	2 1/8	\$1.00	\$1.40
1/4	4	1	2 1/8	1.15	1.70
1/4	4	1 1/4	2 1/8	1.00	1.40
1/4	4	1 1/2	2 1/8	1.15	1.70
1/4	4	1 3/4	2 1/8	1.10	1.55
1/4	4	2	2 1/8	1.20	1.75
1/4	4	2 1/4	2 1/8	1.10	1.55
1/4	4	2 1/2	2 1/8	1.25	1.80
1/4	4	2 3/4	2 1/8	1.30	1.90
1/4	4	3	2 1/8	1.45	2.40
1/4	4	3 1/4	2 1/8	1.50	2.00
1/4	4	3 1/2	2 1/8	1.50	2.00
1/4	4	3 3/4	2 1/8	1.70	2.80
1/4	4	4	2 1/8	1.75	2.85
1/4	4	4 1/4	2 1/8	1.90	3.75
1/4	4	4 1/2	2 1/8	1.80	2.95
1/4	4	4 3/4	2 1/8	1.95	3.85
1/4	4	5	2 1/8	1.90	3.35
1/4	4	5 1/4	2 1/8	2.00	4.05
1/4	4	5 1/2	2 1/8	2.25	3.55
1/4	4	5 3/4	2 1/8	2.25	4.25
1/4	4	6	2 1/8	2.50	4.70
1/4	4	6 1/4	2 1/8	2.25	4.25
1/4	4	6 1/2	2 1/8	2.50	3.80
1/4	4	6 3/4	2 1/8	2.30	4.35
1/4	4	7	2 1/8	2.15	3.95
1/4	4	7 1/4	2 1/8	2.35	4.40
1/4	4	7 1/2	2 1/8	2.60	4.20
1/4	4	7 3/4	2 1/8	2.40	4.60
1/4	4	8	2 1/8	2.50	4.30
1/4	4	8 1/4	2 1/8	2.90	4.90
1/4	4	8 1/2	2 1/8	2.60	4.45
1/4	4	8 3/4	2 1/8	2.75	5.10
1/4	4	9	2 1/8	2.75	5.75
1/4	4	9 1/4	2 1/8	3.00	6.25
1/4	4	9 1/2	2 1/8	3.00	6.50
1/4	4	9 3/4	2 1/8	3.00	6.85
1/4	4	10	2 1/8	3.25	7.45
1/4	4	10 1/4	2 1/8	3.50	8.30

STANDARD T SLOT CUTTERS



In ordering, state whether Right or Left Hand is wanted.

No. of Cutter	Width of Slot A, inches	Diameter of Neck B, inches	Width of Slot C, inches	Depth D, inches	Ex- treme Limit E, inches	No. of Taper	Carbon Steel Cutters, Price Each	High Speed Steel Cutters, Price Each
4	1/4	3/8	1/2	3/8	5/8	4	\$1.50	\$2.10
7	1/4	3/8	1/2	3/8	5/8	5	1.60	2.25
10	1/4	3/8	1/2	3/8	5/8	5	1.80	2.60
13	1/4	3/8	1/2	3/8	5/8	7	2.10	2.25
16	1/4	3/8	1/2	3/8	5/8	5	2.00	2.90
19	1/4	3/8	1/2	3/8	5/8	7	2.20	2.35
22	1/4	3/8	1/2	3/8	5/8	7	3.35	3.65
26	1/4	3/8	1/2	3/8	5/8	7	4.50	4.25
28	1/4	3/8	1/2	3/8	5/8	7	4.60	4.15
31	1/4	3/8	1/2	3/8	5/8	9	2.80	4.80
34	1/4	3/8	1/2	3/8	5/8	9	3.10	5.55
37	1/4	3/8	1/2	3/8	5/8	9	3.45	6.35
40	1/4	3/8	1/2	3/8	5/8	9	3.75	7.75
43	1/4	3/8	1/2	3/8	5/8	9	4.00	8.95

Made 3/4-inch larger in diameter and 1/4-inch greater in thickness than figures given, to allow for sharpening. Other sizes made to order.

END MILLS WITH CENTER CUT

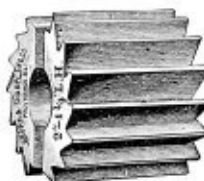


Left Hand Mill.

Always state whether Right or Left Hand is wanted.

Diameter, inches	No. of Taper	Length of Cut, inches	Whole Length, inches	Carbon Steel Cutters, Price Each	High Speed Steel Cutters, Price Each
1/4	5	1	2 3/8	\$1.50	\$2.10
1/4	5	1 1/8	2 3/8	1.80	2.90
1/4	5	1 1/4	2 3/8	1.70	2.45
1/4	5	1 1/2	2 3/8	1.85	2.95
1/4	5	1 3/4	2 3/8	1.80	2.65
1/4	5	2	2 3/8	2.10	3.35
1/4	5	2 1/4	2 3/8	2.15	3.40
1/4	5	2 1/2	2 3/8	2.35	4.40
1/4	5	2 3/4	2 3/8	2.25	3.55
1/4	5	3	2 3/8	2.45	4.55
1/4	5	3 1/4	2 3/8	2.35	3.80
1/4	5	3 1/2	2 3/8	2.60	4.65
1/4	5	3 3/4	2 3/8	2.60	4.20
1/4	5	4	2 3/8	2.70	4.85
1/4	5	4 1/4	2 3/8	2.80	4.35
1/4	5	4 1/2	2 3/8	3.00	5.05
1/4	5	4 3/4	2 3/8	2.75	4.65
1/4	5	5	2 3/8	2.85	5.15
1/4	5	5 1/4	2 3/8	2.90	4.70
1/4	5	5 1/2	2 3/8	2.95	5.25
1/4	5	5 3/4	2 3/8	3.00	4.95
1/4	5	6	2 3/8	3.00	5.50
1/4	5	6 1/4	2 3/8	3.00	5.15
1/4	5	6 1/2	2 3/8	3.10	5.80
1/4	5	6 3/4	2 3/8	3.00	5.25
1/4	5	7	2 3/8	3.20	6.10
1/4	5	7 1/4	2 3/8	3.45	6.70
1/4	5	7 1/2	2 3/8	3.45	6.85
1/4	5	7 3/4	2 3/8	3.75	7.45
1/4	5	8	2 3/8	3.75	7.65

No. 5 Taper fits C, D and K
Collets; No. 7, B and E Collets;
No. 8, F, G, H, I, S and T Collets.

SHELL
END
MILLS

Diameter	Length of Cut, inches	Hole, inches	Carbon Steel Cutters, Price Each	High Speed, Steel Cutters, Price Each
1 1/4	1 1/4	1/2	\$1.90	\$3.00
1 1/4	1 1/4	1/2	2.05	3.20
1 1/4	1 1/4	1/2	2.20	3.40
1 1/4	1 1/4	1/2	2.35	3.70
1 1/4	1 1/4	1/2	2.50	3.90
1 1/4	1 1/4	1/2	2.65	4.20
1 1/4	1 1/4	1/2	2.80	4.50
1 1/4	1 1/4	1/2	2.90	4.80
1 1/4	1 1/4	1/2	3.20	5.10
1 1/4	1 1/4	1/2	3.40	5.45
1 1/4	1 1/4	1/2	3.60	5.75
1 1/4	1 1/4	1/2	3.80	6.10
1 1/4	1 1/4	1/2	4.00	6.50
1 1/4	1 1/4	1/2	4.25	6.85
1 1/4	1 1/4	1/2	4.50	7.50
1 1/4	1 1/4	1/2	4.75	7.65
1 1/4	1 1/4	1	5.00	8.45
1 1/4	1 1/4	1	5.25	8.85
1 1/4	1 1/4	1	5.50	9.20
1 1/4	1 1/4	1	5.75	9.70
1 1/4	1 1/4	1	6.00	10.15
1 1/4	1 1/4	1	6.25	10.60
1 1/4	1 1/4	1	6.50	11.05
1 1/4	1 1/4	1	6.75	11.65
1 1/4	1 1/4	1	7.00	12.00
1 1/4	1 1/4	1	7.25	12.35
1 1/4	1 1/4	1	7.50	12.85
1 1/4	1 1/4	1	7.75	13.25
1 1/4	1 1/4	1	8.00	13.75

In ordering, state whether Right or Left Hand Mills are wanted.



SIDE MILLING CUTTERS

These cutters are often used in pairs for sizing nuts, bolt heads, etc., and are then called "Straddle Mills." They have teeth upon both sides and edges.

Catalog of High Speed Cutters on request.

No.	Diameter, inches	Width of Face, inches	Hole, inches	Price Each	
				Carbon	High Speed
S-10	1/2	1/8	1/8	\$ 2.00	\$ 2.90
S-11	1/2	1/8	1/8	2.05	3.10
S-12	1/2	1/8	1/8	2.10	3.30
S-13	1/2	1/8	1/8	2.15	3.50
S-14	1/2	1/8	1/8	2.20	3.70
S-15	1/2	1/8	1/8	2.25	3.90
S-16	1/2	1/8	1/8	2.30	4.10
S-17	1/2	1/8	1/8	2.35	4.30
S-18	1/2	1/8	1/8	2.40	4.50
S-19	1/2	1/8	1/8	2.45	4.70
S-20	1/2	1/8	1/8	2.50	4.90
S-21	1/2	1/8	1/8	2.55	5.10
S-22	1/2	1/8	1/8	2.60	5.30
S-23	1/2	1/8	1/8	2.65	5.50
S-24	1/2	1/8	1/8	2.70	5.70
S-25	1/2	1/8	1/8	2.75	5.90
S-26	1/2	1/8	1/8	2.80	6.10
S-27	1/2	1/8	1/8	2.85	6.30
S-28	1/2	1/8	1/8	2.90	6.50
S-29	1/2	1/8	1/8	2.95	6.70
S-30	1/2	1/8	1/8	3.00	6.90
S-31	1/2	1/8	1/8	3.05	7.10
S-32	1/2	1/8	1/8	3.10	7.30
S-33	1/2	1/8	1/8	3.15	7.50
S-34	1/2	1/8	1/8	3.20	7.70
S-35	1/2	1/8	1/8	3.25	7.90
S-36	1/2	1/8	1/8	3.30	8.10
S-37	1/2	1/8	1/8	3.35	8.30
S-38	1/2	1/8	1/8	3.40	8.50
S-39	1/2	1/8	1/8	3.45	8.70
S-40	1/2	1/8	1/8	3.50	8.90
S-41	1/2	1/8	1/8	3.55	9.10
S-42	1/2	1/8	1/8	3.60	9.30
S-43	1/2	1/8	1/8	3.65	9.50
S-44	1/2	1/8	1/8	3.70	9.70
S-45	1/2	1/8	1/8	3.75	9.90
S-46	1/2	1/8	1/8	3.80	10.10
S-47	1/2	1/8	1/8	3.85	10.30
S-48	1/2	1/8	1/8	3.90	10.50
S-49	1/2	1/8	1/8	3.95	10.70
S-50	1/2	1/8	1/8	4.00	10.90
S-51	1/2	1/8	1/8	4.05	11.10
S-52	1/2	1/8	1/8	4.10	11.30
S-53	1/2	1/8	1/8	4.15	11.50
S-54	1/2	1/8	1/8	4.20	11.70

Cutters varying from the above list are made to order.



SIDE MILLING CUTTERS

With Inserted Teeth

The teeth are inserted in the periphery of the cast iron body, made of carbon, hardened or high speed steel, but unless otherwise ordered are furnished with high speed. The bushings, screws and teeth are interchangeable, thus allowing the teeth to be easily adjusted or removed.

No.	Diameter, inches	Width of Face, inches	Hole, inches	Price Each	
				Carbon	High Speed
S-100	6	2	1 1/2	\$17.00	\$17.00
S-101	7	2	1 1/2	20.00	20.00
S-102	8	2	1 1/2	22.00	22.00
S-103	9	2	1 1/2	24.00	24.00
S-104	10	2	1 1/2	26.00	26.00

Other sizes made to order; prices on request.



ANGULAR CUTTERS

We keep in stock Angular Cutters of 45°, 50°, 60°, 70° and 80° angle, both right and left hand, suitable for cutting the teeth of cutters and mills.

Always state degree wanted, and whether right or left hand.

Right Hand Cutter.

No.	Diameter, inches	Thickness, inches	Hole, inches	Price Each	
				Carbon	High Speed
J-10	1/2	1/8	1/8	\$2.70	\$4.25
J-11	1/2	1/8	1/8	3.00	4.75
J-12	1/2	1/8	1/8	3.25	5.25
J-13	1/2	1/8	1/8	3.75	6.00



DOUBLE ANGLE CUTTERS

We carry in stock cutters of 45°, 60° or 90° included angle.

No.	Diameter, inches	Thickness, inches	Hole, inches	Price Each	
				Carbon	High Speed
J-100	1/2	1/8	1/8	\$2.70	\$4.25
J-101	1/2	1/8	1/8	3.00	4.75
J-102	1/2	1/8	1/8	3.25	5.25

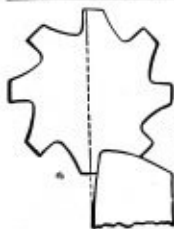


CUTTERS FOR GROOVING TAPS

These cutters are not suitable for fluting reamers. They can be sharpened without changing their form.

In ordering always state diameter of tap or number of cutter as given below.

No. of Cutter	Diam. of Tap, inches	Diam. of Cutter, inches	Hole in Cutter, inches	Price Each	
				Carbon	High Speed
L-50	0 to 1/8	1 3/4	7/8	\$2.00	\$2.85
L-51	1/8 to 1/4	1 3/4	7/8	2.10	3.00
L-52	1/4 to 3/8	1 3/4	7/8	2.20	3.15
L-53	3/8 to 1/2	1 3/4	7/8	2.40	3.55
L-54	1/2 to 3/4	1 3/4	7/8	2.40	3.70
L-55	3/4 to 1	1 3/4	7/8	2.70	4.30
L-56	1 to 1 1/8	1 3/4	7/8	2.70	4.45
L-57	1 1/8 to 2	1 3/4	7/8	3.00	5.25



CUTTERS FOR FLUTING

REAMERS

The cut shows a form of cutter that makes a tooth that allows the chips to be removed more readily and has greater strength than the form made by the cutters for grooving taps and reamers.

In ordering, give number of cutter or diameter of reamer as by the following list:

No. of Cutter	Diameter of Reamer, inches	Number of Teeth	Hole in Cutter, inches	Price Each	
				Carbon	High Speed
L-75	1/8 to 3/8	6	7/8	\$2.00	\$3.10
L-76	3/8 to 1/2	6	7/8	2.10	3.10
L-77	1/2 to 3/4	6	7/8	2.20	3.30
L-78	3/4 to 1	6 to 8	7/8	2.40	3.60
L-79	1 to 1 1/8	10	7/8	2.40	3.75
L-80	1 1/8 to 1 1/2	12	7/8	2.70	4.15
L-81	1 1/2 to 2	12	7/8	2.70	4.30
L-82	2 to 2 1/2	14	7/8	3.00	4.75



CUTTERS FOR GROOVING TAPS AND REAMERS

These Cutters can be sharpened by grinding without changing their form.

In ordering, give number of Cutter, or diameter and number of teeth of Tap or Reamer as by lists below.

No. of Cutter	Diameter of Tap, inches	No. of Teeth in Tap	Diam. of Cutter, inches	Hole in Cutter, inches	PRICE EACH	
					Carbon	H. S'd.
L-10	0 to 1/8	4	1 3/8	7/8	\$2.00	\$2.85
L-11	1/8 to 3/4	4	1 3/8	7/8	2.10	3.00
L-12	3/4 to 1	4	1 3/8	7/8	2.20	3.20
L-13	1 to 1 1/4	4	2 1/8	1 1/8	2.40	3.60
L-14	1 1/4 to 1 3/4	4	2 1/8	1 1/8	2.40	3.70
L-15	1 3/4 to 2	4	2 1/8	1 1/8	2.70	4.30
L-16	1 1/2 to 1 3/4	4	2 3/8	1 3/8	2.70	4.55
L-17	1 1/2 to 2	4	2 3/8	1 3/8	3.00	5.30

No. L-10 Cutter is suitable for grooving taps 1/8 in. or less diameter; No. L-11 for taps larger than 1/8 in. and up to 1/4 in. diameter, etc.

These Cutters are also adapted for fluting reamers, for which purpose it is necessary only to cut one or more grooves of less depth in order to flute unevenly.

No. of Cutter	Diameter of Reamer, inches	No. of Teeth in Ream'r	Diam. of Cutter, inches	Hole in Cutter, inches	PRICE EACH	
					Carbon	H. S'd.
L-25	1/8 to 1/4	6	1 3/8	7/8	\$2.00	\$2.85
L-26	1/4 to 3/8	6	1 3/8	7/8	2.10	3.00
L-27	3/8 to 1/2	6	1 3/8	7/8	2.20	3.20
L-28	1/2 to 3/4	6	2	1	2.40	3.60
L-29	3/4 to 1 1/8	8	2 1/8	1 1/8	2.40	3.60
L-30	1 1/8 to 1 3/8	8	2 1/8	1 1/8	2.40	3.70
L-31	1 3/8 to 1 1/2	10	2 3/8	1 3/8	2.40	3.70
L-32	1 1/2 to 2	10	2 3/8	1 3/8	2.70	4.30

SPROCKET WHEEL CUTTERS

We furnish at short notice Sprocket Wheel Cutters for Roller Chains and Block Center Chains.

CUTTERS FOR ROLLER CHAINS

Circular Pitch, inches	Diameter of Roller, inches	Diam. of Cutter, inches	Hole in Cutter, inches	PRICE EACH	
				Carbon	H. S'd.
3/8	*.47	3	1	\$ 6.50	\$10.30
1/2	.5625	3 3/4	1	7.00	11.65
1 1/4	.5625 or *.625	3 3/4	1	7.00	11.65
1 1/2	.625 or *.750	3 3/4	1 1/4	7.50	12.15
1 3/4	.75 or *.875	4	1 1/4	8.00	14.85
2	*1.125	5	1 1/4	10.00	.....
				12.00	.....

In ordering, specify the number of teeth in the sprocket, and the diameter of the roller.

*"Whitney Standard."

CUTTERS FOR BLOCK, CENTER CHAINS

Circular Pitch, inches	Thickness of Block, inches	Diam. of Cutter, in.	Center to Center of Block, inches	Hole in Cutter, inches	PRICE EACH	
					Carbon	H. S'd.
1 1/2	.4375	3 1/2	.5313	1 1/4	\$7.50	\$12.90
1 3/4	.5	3 3/4	.5625	1 1/4	8.00	14.35

Seven Cutters are made for each pitch, for Nos. of teeth as follows: 8, 9, 10 and 11, 12 and 13, 14 to 16, 17 to 20, 21 and over.

FORMULA

For Calculating Diameters of Sprocket Wheels for Roller Chains

N = Number of Teeth in Sprocket.

P = Pitch of Chain.

D = Diameter of Roller.

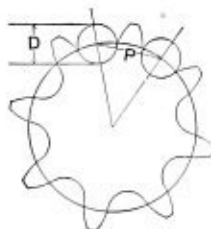
180°

a =

Pitch Diameter = $\frac{P}{\sin a}$

Outside Diameter = Pitch Diameter + D.

Bottom Diameter = Pitch Diameter - D.



CONVEX AND CONCAVE CUTTERS

For Milling Half Circles

These Cutters can be sharpened by grinding without changing their outline.



Convex



Concave

No.	Diam. of Circle, inches	Diam. of Cutter, inches	Size of Hole, inches	PRICE EACH			
				Convex		Concave	
				Carbon	H. S'd.	Carbon	H. S'd.
C-10	1/8	2	7/8	\$2.00	\$ 2.85	\$2.40	\$ 3.50
C-11	1/4	2 1/4	1 1/4	2.25	2.90	2.70	3.15
C-12	3/8	2 1/2	1 1/2	2.50	3.20	3.00	4.40
C-13	1/2	2 3/4	1 3/4	2.80	4.10	3.35	5.00
C-14	3/4	3	2	3.10	4.55	3.70	5.55
C-15	1	3 1/4	2 1/4	3.35	4.95	4.00	6.00
C-16	1 1/4	3 1/2	2 1/2	3.60	5.35	4.30	6.50
C-17	1 1/2	3 3/4	2 3/4	4.00	5.95	4.80	7.85
C-18	1 3/4	4	3	4.40	7.00	5.25	8.75
C-19	2	4 1/4	3 1/4	4.80	8.00	5.75	10.00
C-20	2 1/4	4 1/2	3 1/2	5.25	8.80	6.30	11.00
C-21	2 1/2	4 3/4	3 3/4	5.75	9.90	6.90	12.50
C-22	2 3/4	5	4	6.25	10.80	7.50	13.60
C-23	3	5 1/4	4 1/4	7.00	12.20	8.40	15.70
C-24	3 1/2	5 1/2	4 1/2	7.75	13.50	9.30	17.25



CUTTERS FOR MAKING TWIST DRILLS

These Cutters can be sharpened by grinding without changing their form.

In ordering give number of Cutter.

No. of Cutter	Diam. of Drill, inches	Diam. of Circle made by Cutter, ins.	Diam. of Cutter, inches	Hole in Cut'r ins.	PRICE EACH	
					Carbon	High Speed
L-100	7/8	.06	1 1/4	7/8	\$1.50	\$2.15
L-101	1 1/8	.08	1 3/4	7/8	1.70	2.40
L-102	1 1/4	.11	1 3/4	7/8	1.90	2.70
L-103	1 1/2	.15	1 3/4	7/8	2.10	3.00
L-104	1 3/4	.19	2	7/8	2.30	3.35
L-105	2	.23	2 1/4	7/8	2.40	3.50
L-106	2 1/4	.27	2 1/2	7/8	2.60	3.90
L-107	2 1/2	.31	2 3/4	7/8	2.80	4.10
L-108	2 3/4	.35	3	7/8	3.00	4.45
L-109	3	.39	3 1/4	7/8	3.20	4.75
L-110	3 1/4	.44	3 1/2	7/8	3.40	5.05
L-111	3 1/2	.50	3 3/4	7/8	3.60	5.40
L-112	3 3/4	.56	4	7/8	3.80	5.70
L-113	4	.62	4 1/4	7/8	4.00	6.20
L-114	4 1/4	.70	4 1/2	7/8	4.20	6.55
L-115	4 1/2	.77	4 3/4	7/8	4.50	7.20
L-116	4 3/4	.85	5	7/8	5.00	8.20

PATENT CUTTERS FOR THE TEETH OF
GEAR WHEELS

**Which can be Sharp-
ened by Grinding
without Changing
Their Form.**

Orders should be given by annexed tables, stating the No. of cutter and the Diametral Pitch required. By Diametral Pitch is meant the number of teeth to the inch in diameter on pitch circle of any wheel. In ordering Cutters for worm wheels, give the number of teeth in wheel, the diameter of worm and number of threads to the inch.

Center Line on Gear Cutters. We would call attention to the center line on our Gear Cutters, which may be convenient in setting cutters central with the work spindle.

All Gears of same Pitch cut with these Cutters are interchangeable.

Diametral Pitch	Diameter of Cutter, inches	Hole in Cutter, inches	PRICE EACH		Diametral Pitch	Diameter of Cutter, inches	Hole in Cutter, inches	PRICE EACH	
			Carbon	High Speed				Carbon	High Speed
*1 1/2	7 1/4	1 1/2	32.00	64.00	14	1 1/2	7/8	2.55	3.60
*1 3/4	6 1/2	1 1/2	32.00	44.75	*15	1 1/2	7/8	2.55	3.60
*2	5 3/4	1 1/2	18.50	33.45	16	1 1/2	7/8	2.55	3.60
*2 1/4	5	1 1/2	12.50	22.55	18	1 1/2	7/8	2.55	3.60
*2 1/2	4 1/2	1 1/2	11.25	19.40	20	1 1/2	7/8	2.55	3.60
*3	4 1/4	1 1/2	10.00	16.90	22	1 1/2	7/8	2.55	3.60
*3 1/4	4	1 1/2	9.00	15.10	24	1 1/2	7/8	2.55	3.60
*3 1/2	3 3/4	1 1/2	7.00	11.65	26	1 1/2	7/8	2.55	3.60
*4	3 1/4	1 1/2	6.50	10.90	28	1 1/2	7/8	2.55	3.60
*4 1/4	3 1/2	1 1/2	6.25	10.30	30	1 1/2	7/8	2.55	3.60
*4 1/2	3 1/4	1 1/2	6.00	9.75	32	1 1/2	7/8	2.55	3.60
*5	3 1/4	1 1/2	5.50	8.80	34	1 1/2	7/8	2.55	3.60
*5 1/4	3 1/2	1 1/2	5.00	7.95	*38	1 1/2	7/8	2.55	3.60
*5 1/2	3 1/4	1 1/2	4.50	7.15	40	1 1/2	7/8	2.55	3.60
*6	3 1/4	1 1/2	4.20	6.65	*44	1 1/2	7/8	2.55	3.60
*7	3 1/4	1 1/2	3.90	5.95	48	1 1/2	7/8	2.55	3.60
*8	3 1/4	1 1/2	3.60	5.40	*50	1 1/2	7/8	2.55	3.60
*9	3 1/4	1 1/2	3.40	5.00	56	1 1/2	7/8	2.55	3.60
*10	3 1/4	1 1/2	3.20	4.75	*60	1 1/2	7/8	2.55	3.60
*11	3 1/4	1 1/2	3.00	4.35	64	1 1/2	7/8	2.55	3.60
*12	3 1/4	1 1/2	2.75	4.00	*70	1 1/2	7/8	2.55	3.60
*13	3 1/4	1 1/2	2.50	3.80	80	1 1/2	7/8	2.55	3.60
			2.60	3.75	*120	1 1/2	7/8	2.55	3.60

Cutters marked * are not kept in stock, but are made to order.

Eight cutters are made for each pitch, as follows:

- No. 1 will cut wheels from 135 teeth to a rack.
- No. 2 will cut wheels from 55 teeth to 134 teeth.
- No. 3 will cut wheels from 35 teeth to 54 teeth.
- No. 4 will cut wheels from 26 teeth to 34 teeth.
- No. 5 will cut wheels from 21 teeth to 25 teeth.
- No. 6 will cut wheels from 17 teeth to 20 teeth.
- No. 7 will cut wheels from 14 teeth to 16 teeth.
- No. 8 will cut wheels from 12 teeth to 13 teeth.

We are prepared to furnish to order Gear Cutters from 2 to 8 pitch inclusive of half numbers, for the accommodation of those who require a finer division of the number of teeth to be cut with each cutter than can be cut with the regular number. The Nos. 1 to 8, as listed above, are the regular cutters as furnished heretofore.

The half numbers are as follows:

No. of Cutter	Range	No. of Cutter	Range
1 1/2	80 to 134 teeth	5 1/2	19 to 20 teeth
2 1/2	42 " 54 "	6 1/2	15 " 16 "
3 1/2	30 " 34 "	7 1/2	13 "
4 1/2	23 " 25 "		

IMPROVED STOCKING CUTTER FOR
INVOLUTE GEARS

Diametral Pitch	Diameter of Cutter, inches	Size of Hole in Cutter, inches	PRICE EACH	
			Carbon	High Speed
*1 1/4	7 1/4	1 1/4	\$19.20	\$22.50
*1 1/2	6 1/2	1 1/2	14.40	24.30
*1 3/4	5 3/4	1 3/4	11.10	18.65
*2	5	2	7.50	12.85
*2 1/4	4 1/2	2 1/4	6.75	11.15
*2 1/2	4 1/4	2 1/2	6.00	9.80
*3	4	3	5.40	8.70
*3 1/4	3 3/4	3 1/4	4.20	6.85
*3 1/2	3 1/2	3 1/2	3.90	6.30
*4	3 1/4	4	3.75	6.00
*4 1/4	3 1/2	4 1/4	3.60	5.70
*4 1/2	3 1/4	4 1/2	3.30	5.20
*5	3 1/4	5	3.00	4.70
*5 1/4	3 1/2	5 1/4	2.70	4.20
*5 1/2	3 1/4	5 1/2	2.50	3.85
*6	3 1/4	6	2.35	3.55
*7	3 1/4	7	2.20	3.30
*8	3 1/4	8	2.05	3.05

Cutters marked * are not carried in stock, but are made to order. Cutters furnished for use on Nos. 3, 4, 5 and 6 Automatic Gear Cutting Machines, both Carbon and High Speed Steel.

FACE MILLING CUTTERS

With Inserted Teeth



Left Hand Cutter

The cut shows a form of cutter specially adapted for all classes of face milling.

The body is of cast iron, provided with a taper hole and key-way, and is held firmly in place on the arbor by a screw.

The teeth are of either carbon tool steel, hardened, or of high speed steel; but, unless otherwise ordered, are furnished of high speed steel. They are held in place by taper bushings and screws and can thus be easily adjusted or removed. The bushings, screws and teeth are interchangeable.

No. of Mill	Size ins.	Face A ins.	Face B ins.	No. of Taper Hole	No. of Arbor on which Cutter can be used	With Carbon Steel Blades Price per Cutter	With High Speed Steel Blades Price per Cutter
1	5 1/2	2 1/4	1 1/4	10	79 or 80	\$12.00	\$12.00
2	5 1/2	2 1/4	1 1/4	10	81, 82, 84, 85 or 87	12.00	12.00
3	5 1/2	2 1/4	1 1/4	12	79 or 80	14.00	14.00
4	6 1/2	2 1/4	1 1/4	12	81, 82, 83, 84, 85 or 87	14.00	14.00
5	7 1/2	2 1/4	1 1/4	12	81, 82, 83, 84, 85 or 87	16.00	16.00
6	8 1/2	2 1/4	1 1/4	12	81, 82, 83, 84, 85 or 87	18.00	18.00
7	9 1/2	2 1/4	1 1/4	12	81, 82, 83, 84, 85 or 87	20.00	20.00

In ordering, state whether Right or Left Hand cutters are wanted. Other sizes made to order.



PATENT INVOLUTE CUTTERS

For Teeth of Gear Wheels

Pitch	DIAMETER OF CUTTER		Hole, inches	PRICE OF CUTTER	
	Tool Steel, inches	High Speed Steel, inches		Tool Steel	High Speed Steel
4	3 1/2	3 5/8	1	\$5.50	\$8.80
*4 1/2	3 3/8	3 1/2	1	5.00	7.95
5	3 1/4	3 3/8	1	4.50	7.15
5 1/2	3 3/8	3 1/4	1	4.20	6.65
6	3	3 1/8	1	3.90	5.95
7	2 7/8	2 7/8	1	3.60	5.40
8	2 7/8	2 7/8	1	3.40	5.00
9	2 3/4	2 3/4	1	3.20	4.75
10	2 3/4	2 3/4	1	3.00	4.35
11	2 5/8	2 5/8	1	2.75	4.00
12	2 5/8	2 5/8	1	2.65	3.80
*13	2 5/8	2 5/8	1	2.60	3.75
14	2 1/2	2 1/2	1	2.55	3.65
*15	2 1/2	2 1/2	1	2.50	3.60
16	2 1/2	2 1/2	1	2.45	3.50
18	2 3/8	2 3/8	1	2.35	3.40
20	2 3/8	2 3/8	1	2.30	3.30
22	2 1/4	2 1/4	1	2.20	3.10
24	2 1/4	2 1/4	1	2.10	3.00
*26	2 1/4	2 1/4	1	2.00	2.65
*28	2 1/4	2 1/4	1	2.00	2.55
*30	2 1/4	2 1/4	1	2.00	2.55
*32	2 1/4	2 1/4	1	2.00	2.55
*34	2 1/4	2 1/4	1	2.00	2.55
*36	2 1/4	2 1/4	1	2.00	2.55
*38	2 1/4	2 1/4	1	2.00	2.55
*40	2 1/4	2 1/4	1	2.00	2.55
*44	2 1/4	2 1/4	1	2.00	2.55
*48	2 1/4	2 1/4	1	2.00	2.55

Cutters marked * are not kept in stock, but are made to order.

Eight cutters made for each pitch.

3 pitch and coarser in Cast Iron and 4 pitch and coarser in Steel require 2 cuts to insure accuracy.

CUTTERS FOR MITER AND BEVEL GEARS

For Use on No. 13 Automatic Gear Cutting Machines

Diametral Pitch	DIAMETER OF CUTTER		Hole in Cutter, inches	PRICE OF CUTTER	
	Tool Steel, inches	High Speed Steel, inches		Tool Steel	High Speed Steel
4	3 1/4	3 1/4	1 1/4	\$5.50	\$8.80
5	3 3/8	3 3/8	1 1/4	4.50	7.15
6	3 1/2	3 1/2	1 1/4	3.90	5.95
7	3 1/2	3 1/2	1 1/4	3.60	5.40
8	3 1/4	3 1/4	1 1/4	3.40	5.00
10	3 1/4	3 1/4	1 1/4	3.00	4.35
12	3	3	1 1/4	2.65	3.80
14	3	3	1 1/4	2.55	3.65
16	2 3/4	2 3/4	1 1/4	2.45	3.50
20	2 1/2	2 1/2	1 1/4	2.30	3.30
24	2 1/4	2 1/4	1 1/4	2.10	3.00

Eight cutters made for each pitch.

3 pitch and coarser in Cast Iron and 4 pitch and coarser in Steel require 2 cuts to insure accuracy.

FOR BEST RESULTS KEEP CUTTERS SHARP

CORNER-ROUNDING CUTTERS



Left Hand



Double



Right Hand

These cutters have side as well as radial clearance and can be ground without changing their outline.

In ordering single cutters, state whether Right or Left Hand is wanted.

Radius of Circle, inches	Diameter, inches	Hole, inches	CARBON STEEL CUTTERS		HIGH SPEED CUTTERS	
			Price Single Cutter	Price Double Cutter	Price Single Cutter	Price Double Cutter
1/4	2	7/8	\$2.00	\$2.40	\$2.90	\$3.50
3/8	2	7/8	2.25	2.70	3.30	3.95
1/2	2	7/8	2.50	3.00	3.65	4.40
5/8	2 1/4	7/8	2.70	3.35	4.05	4.95
3/4	2 1/4	7/8	2.90	3.70	4.35	5.50
7/8	2 1/4	7/8	3.10	4.00	4.65	6.00
1	2 1/4	7/8	3.30	4.30	4.95	6.45
1 1/4	2 3/4	1	3.50	4.80	5.70	7.65
1 1/2	3	1	3.70	5.25	5.90	8.65
1 3/4	3 1/4	1	3.90	5.75	6.35	9.75
2	3 1/2	1	4.20	6.30	6.80	11.00
2 1/4	3 3/4	1	4.50	6.90	8.10	12.45
2 1/2	3 3/4	1	5.00	7.50	9.00	13.50
2 3/4	3 3/4	1	5.75	8.40	10.40	15.40
3	3 3/4	1	6.50	9.30	11.80	17.00

PATENT INVOLUTE CUTTERS

For Teeth of Gear Wheels

For Use on No. 6 Automatic Gear Cutting Machines

Pitch	DIAM. OF CUTTER		Hole, inches	PRICE OF CUTTER	
	Tool Steel, inches	High Speed Steel, inches		Tool Steel	High Speed Steel
1 1/4	6 1/2	6 1/2	1 3/4	\$18.50	\$40.15
2	6 1/2	6 1/2	1 3/4	14.00	29.35
*2 1/4	6 1/4	6 1/4	1 3/4	12.75	25.25
2 1/2	5 3/8	5 3/8	1 3/4	11.00	22.00
*2 3/4	5 3/8	5 3/8	1 3/4	10.00	19.65
3	5 3/8	5 3/8	1 3/4	8.50	15.15
*3 1/4	5 1/4	5 1/4	1 3/4	8.25	14.20
*3 1/2	5	5 1/4	1 3/4	7.75	13.40
*3 3/4	4 3/4	5	1 3/4	7.25	12.70
4	4 3/8	4 3/4	1 3/4	6.75	11.45
*4 1/2	4 1/2	4 3/8	1 3/4	6.25	10.35
5	4 3/8	4 3/8	1 3/4	5.75	9.30
*5 1/2	4 3/8	4 3/8	1 3/4	5.75	8.65
6	4 1/4	4 1/4	1 3/4	5.50	7.75
*7	4 3/8	4 3/8	1 3/4	5.25	7.05
*8	4	4	1 3/4	5.00	6.50

Cutters marked * are not kept in stock, but are made to order.

METAL SLITTING SAWS



These are thin MILLING CUTTERS. They are ground on the sides and left a little thicker at the outer edge than near the centre to give a proper clearance in cutting deep slots.

In ordering special saws please state for what purpose they are required.

No.	Diameter, inches	Thickness, inches	Hole, inches	Price
G-50	2 1/2	1/32	7/8	\$1.00
G-51	2 1/2	1/16	7/8	1.00
G-52	2 1/2	1/8	7/8	.90
G-53	2 1/2	3/16	7/8	.90
G-54	2 1/2	1/4	7/8	.90
G-55	2 1/2	5/16	7/8	1.10
G-56	3	1/32	1	1.25
G-57	3	1/16	1	1.10
G-58	3	1/8	1	1.00
G-59	3	3/16	1	1.00
G-60	3	1/4	1	1.00
G-61	3	5/16	1	1.15
G-62	3	3/8	1	2.25
G-63	4	1/32	1	1.45
G-64	4	1/16	1	1.25
G-65	4	1/8	1	1.20
G-66	4	3/16	1	1.20
G-67	4	1/4	1	1.40
G-68	4	5/16	1	1.60
G-69	5	1/8	1	1.80
G-70	5	3/16	1	1.60
G-71	5	1/4	1	1.50
G-72	5	5/16	1 1/4	1.50
G-73	5	3/8	1 1/2	1.50
G-74	5	7/16	1	1.90
G-75	5	1/2	1	2.30
G-76	6	1/8	1	4.00
G-77	6	3/16	1	3.00
G-78	6	1/4	1	2.70
G-79	6	5/16	1 1/4	3.50
G-80	6	3/8	1	3.50
G-81	7	1/4	1	4.50
G-82	7	5/16	1	3.80
G-83	7	3/8	1	5.75
G-84	8	1/2	1	



CIRCULAR SAWS

For Metal

These Metal Saws are of very fine quality and temper, varying in thickness from No. 8 to 30, Brown & Sharpe wire gauge. These Saws have 1/4-inch hole.

PRICE EACH

Gauge No.	DIAMETER									Thickness
	3/8	1	1 1/2	2	2 1/2	3	4	5	6	
8	.38	.39	.42	.46	.52	.60	.86	1.30	1.94	.128
9	.33	.34	.37	.41	.47	.55	.81	1.25	1.89	.114
10	.28	.29	.32	.36	.42	.50	.76	1.20	1.84	.102
11	.25	.26	.29	.33	.39	.47	.73	1.17	1.81	.091
12	.22	.23	.26	.30	.36	.44	.70	1.14	1.78	.081
13	.19	.20	.23	.27	.33	.41	.67	1.11	1.75	.072
14	.17	.18	.21	.25	.31	.39	.65	1.09	1.73	.064
15	.15	.16	.19	.23	.29	.37	.63	1.07	1.71	.057
16	.13	.14	.17	.21	.27	.35	.61	1.05	1.69	.051
17	.12	.13	.16	.20	.26	.34	.60	1.04	1.68	.045
18	.11	.12	.15	.19	.25	.33	.59	1.03	1.67	.040
19	.10	.11	.14	.18	.24	.32	.58	1.02	1.66	.035

All saws thinner than No. 19 gauge are same price as No. 19. For list per dozen add cipher to above list prices.



SCREW SLOTTING CUTTERS

These Cutters have a fine pitch of teeth especially adapted for the slotting of screw heads and similar work.

They are not ground on the sides.

No.	Thickness of Cutter by Am. Standard Wire Gauge	Thickness of Cutter in Decimals	Diameter of Cutter in inches	Size of Hole, inches	Price Each
H-10	No. 5	.182	2 1/2	1	\$0.70
H-11	6	.162	2 1/2	1	.60
H-12	7	.144	2 1/2	1	.50
H-13	8	.128	2 1/2	1	.45
H-14	9	.114	2 1/2	1	.40
H-15	10	.102	2 1/2	1	.35
H-16	11	.091	2 1/2	1	.30
H-17	12	.081	2 1/2	1	.25
H-18	13	.072	2 1/2	1	.20
H-19	14	.064	2 1/2	1	.20
H-20	15	.057	2 1/2	1	.15
H-21	16	.051	2 1/2	1	.15
H-22	17	.045	2 1/2	1	.15
H-23	18	.040	2 1/2	1	.15
H-24	19	.035	2 1/2	1	.15
H-25	20	.032	2 1/2	1	.15
H-26	21	.028	2 1/2	1	.15
H-27	22	.025	2 1/2	1	.15
H-28	23	.023	2 1/2	1	.15
H-29	24	.020	2 1/2	1	.15
H-30	25	.018	2 1/2	1	.15
H-31	26	.016	2 1/2	1	.15
H-32	27	.014	2 1/2	1	.15
H-33	28	.012	2 1/2	1	.15
H-34	30	.010	2 1/2	1	.15
H-35	32	.008	2 1/2	1	.15
H-36	34	.006	2 1/2	1	.15
H-37	20	.032	2 1/2	1	.15
H-38	21	.028	2 1/2	1	.15
H-39	22	.025	2 1/2	1	.15
H-40	23	.023	2 1/2	1	.15
H-41	24	.020	2 1/2	1	.15
H-42	25	.018	2 1/2	1	.15
H-43	26	.016	2 1/2	1	.15
H-44	27	.014	2 1/2	1	.15
H-45	28	.012	2 1/2	1	.15
H-46	30	.010	2 1/2	1	.15
H-47	32	.008	2 1/2	1	.15
H-48	34	.006	2 1/2	1	.15
H-49	14	.064	1 1/2	3/4	.15
H-50	15	.057	1 1/2	3/4	.15
H-51	16	.051	1 1/2	3/4	.15
H-52	17	.045	1 1/2	3/4	.15
H-53	18	.040	1 1/2	3/4	.15
H-54	19	.035	1 1/2	3/4	.15
H-55	20	.032	1 1/2	3/4	.15
H-56	21	.028	1 1/2	3/4	.15
H-57	22	.025	1 1/2	3/4	.15
H-58	23	.023	1 1/2	3/4	.15
H-59	24	.020	1 1/2	3/4	.12
H-60	25	.018	1 1/2	3/4	.12
H-61	26	.016	1 1/2	3/4	.12
H-62	27	.014	1 1/2	3/4	.12
H-63	28	.012	1 1/2	3/4	.12
H-64	30	.010	1 1/2	3/4	.12
H-65	32	.008	1 1/2	3/4	.12
H-66	34	.006	1 1/2	3/4	.12

Cutters varying from the list are made to order.

SCREW SLOTTING CUTTER ARBORS



These Arbors are for use with screw slotting cutters and are adapted for use on centres. The following sizes are carried in stock: 3/8-in., 1/2-in., 3/4-in., 1-in., 1 1/2-in. Price, each.....\$2.50

H.Channon Company. Chicago.

S. & G. INSERTED TOOTH HIGH SPEED MILLING CUTTERS

These cutters are made of the very best high speed steel. The body is of an annealed material and the high grade temper is in the milling teeth only. The form of tooth gives a much greater clearance for chip or cutting, which is a big feature in rapid milling. We have all sizes and styles.



MILLING CUTTERS

High Speed Teeth Carbon Steel Body

Larger sizes can be furnished. Prices on Application.

Diameter Cutters, inches	Width Face, inches	Size Hole, inches	Price, Each
2 1/2	1/4	7/8	\$ 4.80
2 1/2	1/8	7/8	4.80
2 1/2	3/8	7/8	4.80
2 1/2	1/2	7/8	4.80
2 1/2	3/4	7/8	4.80
2 1/2	1	7/8	5.10
2 1/2	1 1/4	7/8	5.40
2 1/2	1 1/2	7/8	5.70
2 1/2	1 3/4	7/8	6.00
2 1/2	2	7/8	6.60
2 1/2	2 1/2	7/8	7.20
2 1/2	3	7/8	8.00
2 1/2	3 1/2	7/8	8.60
2 1/2	4	7/8	9.00
2 1/2	4 1/2	7/8	9.40
2 1/2	5	7/8	10.40
3	1/4	1	4.80
3	1/8	1	4.80
3	3/8	1	4.80
3	1/2	1	4.80
3	5/8	1	5.10
3	3/4	1	5.40
3	1	1	5.70
3	1 1/4	1	6.00
3	1 1/2	1	6.60
3	1 3/4	1	7.20
3	2	1	8.00
3	2 1/2	1	8.60
3	3	1	9.00
3	3 1/2	1	9.40
3	4	1	10.40
3	4 1/2	1	11.20
4	1/4	1 1/4	5.50
4	1/8	1 1/4	5.50
4	3/8	1 1/4	5.50
4	1/2	1 1/4	6.15
4	5/8	1 1/4	6.85
4	3/4	1 1/4	7.25
4	1	1 1/4	7.65
4	1 1/4	1 1/4	8.05
4	1 1/2	1 1/4	8.45
4	1 3/4	1 1/4	9.30
4	2	1 1/4	10.25
4	2 1/2	1 1/4	11.60
4	3	1 1/4	12.70
4	3 1/2	1 1/4	13.70
4	4	1 1/4	14.80
4	4 1/2	1 1/4	16.00
4	5	1 1/4	17.20
4	5 1/2	1 1/4	19.00
4	6	1 1/4	21.30
4	6 1/2	1 1/4	23.50

SIDE OR STRADDLE MILLING CUTTERS

High Speed Teeth Carbon Steel Body



Diameter Cutters, inches	Width Face, inches	Size Hole, inches	Price Each	Diameter Cutters, inches	Width Face, inches	Size Hole, inches	Price Each
2 1/2	1/4	7/8	\$4.80	3	1/4	1	\$6.15
2 1/2	1/8	7/8	4.80	3	1/8	1	7.05
2 1/2	3/8	7/8	5.10	3	3/8	1	7.45
2 1/2	1/2	7/8	5.40	3	1/2	1	7.85
2 1/2	3/4	7/8	5.70	3	5/8	1	8.25
2 1/2	1	7/8	6.00	3	3/4	1	8.65
2 1/2	1 1/4	7/8	6.60	3	1	1	9.05
2 1/2	1 1/2	7/8	7.20	3	1 1/4	1	9.45
2 1/2	1 3/4	7/8	7.80	3	1 1/2	1	10.25
2 1/2	2	7/8	8.40	3	1 3/4	1	11.05
2 1/2	2 1/2	7/8	9.00				

RIGHT OR LEFT HAND ANGULAR CUTTERS High Speed Teeth, Carbon Steel Body



Single Angle

Single Cutters, right or left hand, furnished in 40, 50, 60, 70 and 80 degree angle.

Double Cutters furnished in 45, 60 and 90 degree angle.

Double Angle

Single Angle, Right or Left Hand

Diameter Cutters, inches	Width Face, inches	Size Hole, inches	Price Each
2 1/2	1/2	7/8	\$4.80
2 3/4	1/2	7/8	4.80
3	1/2	7/8	4.95
3 1/2	1/2	1	5.70

Double Angle

Diameter Cutters, inches	Width Face, inches	Size Hole, inches	Price Each
2 1/2	1/2	7/8	\$4.80
2 3/4	1/2	1	4.90
3	1/2	1	5.70

Other sizes than above take special list.



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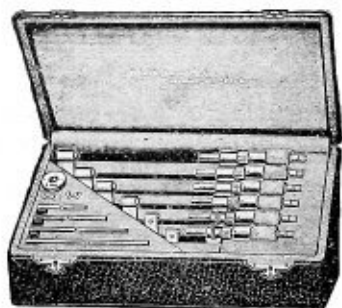
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Every Caliper is provided with a clamp ring which clamps the spindle and preserves the setting.	
Price.....	\$6.50
With ratchet stop.....	7.00
Morocco Case.....	.50

MICROMETER CALIPER No. 4

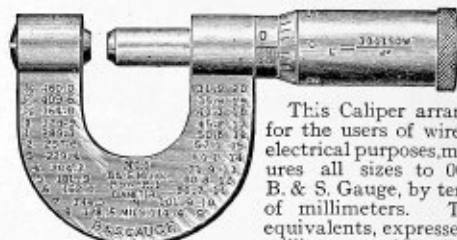
Half Inch

English or Metric Measure

This Caliper measures all sizes less than one-half inch by thousandths of an inch. The outer end of the frame is the same size as the measuring spindle and the edges of the measuring surfaces are not beveled but are left square. This Caliper is also made to measure all sizes less than thirteen millimeters by hundredths of a millimeter. When so made the table of decimal equivalents is omitted.	
Price.....	\$4.50
With ratchet stop.....	5.00
Morocco Case.....	.50

MICROMETER CALIPER No. 6

For Electricians



This Caliper arranged for the users of wire for electrical purposes, measures all sizes to 0000, B. & S. Gauge, by tenths of millimeters. The equivalents, expressed in millimeters, of the different

ent sizes of wire from 0000 to 20, B. & S. Gauge, are stamped on one side of the frame and the circular millimeters of the same size on the other.

Price.....	\$5.50
With ratchet stop.....	6.00
Morocco Case.....	.50

No. 7. Is the same as No. 6, except that the equivalents stamped on one side of frame are for wire from 21 to 44 B. & S. Gauge. The price is the same.

MICROMETER CALIPER No. 19

One Inch

English or Metric Measure



This Caliper measures all sizes less than an inch by thousandths of an inch. The outer end of the frame is the same size as the measuring spindle and the edges of the measuring surfaces are not beveled but are left square.

This Caliper is also made to read to hundredths of a millimeter. Price.....	\$5.00
With ratchet stop.....	5.50
Morocco Case.....	.50

MICROMETER CALIPER No. 20

This Caliper differs from Micrometer Caliper No. 19, English, only in being graduated to read to ten-thousandths, as well as to thousandths, of an inch.	
Price.....	\$6.00
With ratchet stop.....	6.50
Morocco Case.....	.50

ONE-INCH MICROMETER HEADS

English or Metric Measure

Graduated to read to thousandths of an inch. Price, with or without ratchet stop.....	\$3.50
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Graduated to read to thousandths and ten-thousandths of an inch. Price, with or without ratchet stop.....	\$4.50
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These Micrometer Heads are readily attached to machines or tools, when fine adjustments are required.

Length, from lower end of barrel to shoulder, $\frac{3}{4}$ inch; diameter, $\frac{3}{8}$ inch.

Metric Measure

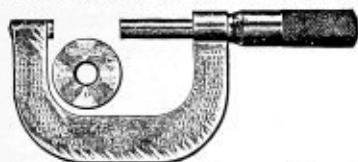
This Head is also furnished to read to hundredths of a millimeter.



BROWN & SHARPE TOOLS

MICROMETER CALIPER No. 38

One to Two Inches. English or Metric Measure

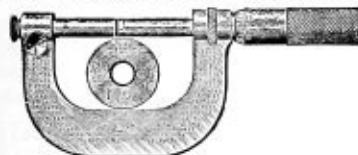


This caliper measures all sizes above one inch and less than two inches by thousandths of an inch. The outer end of the frame is the same size as the measuring spindle and the edges of the measuring surfaces are not beveled but are left square. It gauges under a shoulder or measures a small projection on a plain surface.

This caliper is also made to measure all sizes between twenty-five and fifty millimeters by hundredths of a millimeter. When so made, the table of decimal equivalents is omitted. Price.....\$6.00
With ratchet stop.....6.50
Morocco case......75

MICROMETER CALIPER No. 45

Two Inches. English or Metric Measure



This caliper measures all sizes less than two inches by thousandths of an inch. It is similar in general design to the Nos. 8 and 10. This caliper is also made to measure all sizes less than fifty millimeters by hundredths of a millimeter. When so made, the table of decimal equivalents is omitted.

Every caliper is provided with a clamp ring which clamps the spindle and preserves the setting. Price.....\$8.00
With ratchet stop.....8.50
Morocco case......75

MICROMETER CALIPER No. 55

English or Metric Measure



This micrometer caliper measures all sizes from 3 inches to 6 inches in length and 6 inches in diameter by thousandths of an inch and one-half and one-quarter thousandths are easily estimated.

Three anvils are furnished; the long anvil measures from 3 inches to 4 inches, the intermediate from 4 inches to 5 inches and the short one from 5 inches to 6 inches.

Each anvil is provided with separate means of adjustment for wear. They are easily and quickly inserted in the frame and are held solidly to their bearings by a knurled nut.

Means of adjustment for the measuring screw are also provided.

This caliper is also made to measure all sizes above .75 and less than 150 millimeters by hundredths of a millimeter.

Price, with standards.....\$14.00
With ratchet stop.....14.50
Price, without standards.....10.00
With ratchet stop.....10.50

Standards

A set of three standards is furnished when desired. Price, per set.....\$4.00

All Micrometers sent without case or ratchet stop unless otherwise ordered.

MICROMETER CALIPERS Nos. 83-86

English or Metric Measure



An inexpensive, accurate measuring tool, more convenient for general use than the bar micrometer or vernier, as they can be more readily set for different measurements and are more easily handled where rapid measurements are required.

The frame is of I section, thus combining the greatest rigidity and strength with lightness.

No.	Range	Measurement by	Price with Ratchet Stop	Price without Ratchet Stop
83	2 in. to 3 in.	1000ths	\$6.00	\$6.50
84	3 " " 4 "	"	6.50	7.00
85	4 " " 5 "	"	7.25	7.75
86	5 " " 6 "	"	8.00	8.50

These calipers are also made to read to hundredths of a millimeter. Standard for adjusting furnished with each caliper.

INSIDE MICROMETER GAUGES

English or Metric Measure



This gauge consists of a holder with a micrometer screw and thimble graduated to read to .001 in.

The extension rods are graduated by a series of angular grooves of a form and depth that allow the clamping fingers to spring in and the adjustments quickly and positively made.

No. 800 —5 rods—2 in. to 9 1/2 in. with case \$5.25 without \$4.50
" 800A —6 " —50 m / m 230 m / m " 5.25 4.50

HEIGHT GAUGE ATTACHMENT

For use with Nos. 800 and 800-A inside micrometer gauges.

The measuring rod is inserted upwards through the under side of the base and the clamping fingers; and by turning the knurled nut, the rod is held firmly in an upright position. The micrometer is then adjusted and clamped to the upper end of the rod.

The base has a V-shaped groove in the bottom, which adapts the Gauge for use in cylindrical work.

Price.....\$0.75



MICROMETER DEPTH GAUGES

English or Metric Measure

The micrometer depth gauge shown in cut will measure all distances to 2 1/2 in. by .001 in. The screw has a movement of 1/2 in. The rod is graduated in 1/2 in. The graduations are of such a form and depth that the clamping fingers, at end of gauge spring in, allowing the 1/2 in. adjustments of the rod to be quickly and positively made.

The base is about 7/16 in. thick, and, together with the point of the rod, is hardened.

This depth gauge is also made to measure all distances to 63 millimeters by hundredths of a millimeter.

No. 810. 2 inch base. Price.....\$4.50
In Morocco case.....5.00
No. 812. 4 inch base. Price.....5.00
In Morocco case.....5.50



BROWN & SHARPE TOOLS

UNIVERSAL DEPTH GAUGE No. 711

English Measure



A spiral spring in the barrel forces the blade against the bottom of the hole or recess. A friction clutch, free to move under pressure of the spiral spring, holds the blade without clamping. A clamp nut at the top of the barrel clamps the blade securely in position.

The blade is a narrow 6 in. tempered steel rule graduated to 64ths on one side and 100ths on the other. The blade can be swiveled completely round without disturbing the setting. The base is about 3 in. long, 7-16 in. wide and carefully hardened and ground.

Other blades. We furnish, when desired, blades graduated to 32ds and 64ths or 50ths and 100ths.

Price, each.....\$3.00

SPRING DEPTH GAUGES

The cut shows the head of the depth gauge together with a portion of the barrel and rod. It will measure to 3 in. in depth.

The base is about 7-16 in. wide and the rod about 1-8 in. in diameter.

A spiral spring in the barrel forces the rod against the bottom of the hole or recess to be measured and by use of the clamp screw the rod is securely locked in position.

The base and lower end of the rod are both hardened.

No. 713. 2 in. base. Price..\$1.50

No. 717. 4 in. base. Price.. 2.00

No. 725

This gauge differs from No. 713 only in that the rod is held by a friction clutch that is free to move under pressure of the spiral spring and enables approximate settings to be quickly made.

No. 725. 3 in. base. Price..\$2.25



6 INCH RULE DEPTH GAUGE No. 715

English Measure

The cut shows the head and a portion of the blade of a 6 in. rule depth gauge.

The head can be conveniently held. It is made of steel $\frac{1}{8}$ in. thick, hardened.

The blade is a 6 in. narrow tempered steel rule.

The blade sent with the gauge is divided into 64ths and 100ths of inches.

Will furnish, if desired, blades divided into 32ds and 64ths, or 50ths and 100ths of inches.

This depth gauge is also furnished with a blade 15 centimeters long, graduated on one corner to $\frac{1}{16}$ millimeter and on the other corner to 1 millimeter.

Price.....\$1.25



STANDARD STEEL RULES



No.	Length, inches	Approximate Width, inches	Number of Graduations	Price
100	1	$\frac{1}{16}$	4 or 7	\$0.15
102	2	$\frac{1}{8}$	4, 7 or 9	.25
104	3	$\frac{1}{4}$	1, 2, 4, 6 or 7	.35
106	4	$\frac{3}{8}$	1, 2, 4, 6 or 7	.45
108	6	$\frac{1}{2}$	1, 2, 4, 6 or 7	.65
110	9	$\frac{3}{4}$	1, 2, 4, 6 or 7	1.00
112	12	1	1, 2, 4, 6 or 7	1.25
114	12	1	5	2.50
116	18	$1\frac{1}{8}$	1, 2, 4, 6 or 7	2.00
118	24	$1\frac{1}{4}$	1, 2, 4, 6 or 7	2.50
120	24	$1\frac{1}{2}$	5	5.00
122	36	2	1, 2, 4, 6 or 7	5.00
124	48	3	1, 2, 4, 6 or 7	8.00

Furnished with No. 4 graduation unless otherwise ordered.

GRADUATIONS

Our rules, both standard and tempered, are divided in parts of an inch, as follows:

No. 1 Graduation	No. 2 Graduation	No. 4 Graduation
1st cor. 10, 20, 50, 100	8	8
2d cor. 12, 24, 48	10, 20, 50, 100	16
3d cor. 14, 28	12, 24, 48	32
4th cor. 16, 32, 64	16, 32, 64	64

No. 5 Graduation

1st cor. 11, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25
2d cor. 16, 32, 64
3d cor. 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38
4th cor. 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 100

No. 6 Graduation No. 7 Graduation No. 9 Graduation

No. 6 Graduation	No. 7 Graduation	No. 9 Graduation
1st cor. 32	16	10, 20
2d cor. 48	32	16
3d cor. 50	64	32, 64
4th cor. 64	100	50, 100

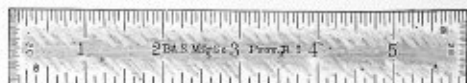
No. 10 Graduation	No. 11 Graduation	No. 12 Graduation
1st cor. 32	64	50
2d cor. 64	100	100

No. 13 Graduation	No. 14 Graduation
1st cor. 8	8
2d cor. 16	32

Standard steel rules, from 2 in. to 24 in. and tempered steel rules, 10 in. to 12 in. in length, with No. 4 graduations only, are furnished with patent end graduations without additional cost.

STANDARD STEEL RULES

With Patent End Graduations



These rules can be conveniently introduced into grooves, countersinks and recesses of various kinds and are adapted for measuring their depth and width.

They are made of specific widths and the ends are graduated as follows: 2 in. and 4 in. rules to 32ds, 48ths, 50ths, and 100ths of an inch; the 6 in. to 24 in. rules to 28ths, 32ds, 48ths and 100ths of an inch; the 3 in. rules are graduated to 32ds, 40ths, 48ths and 50ths of an inch.

These rules are furnished with No. 4 graduations only. For prices, see list of standard rules.

BROWN & SHARPE TOOLS

NARROW STEEL RULE



No. 130. Price, 65 Cents

We carry in stock a steel rule, not tempered, 6 in. long, about $1\frac{1}{16}$ in. wide and furnish it with Nos. 1, 2, 4, 6 or 7 graduations. This rule corresponds to the Standard Steel Rule but is lighter.

NARROW TEMPERED STEEL RULES



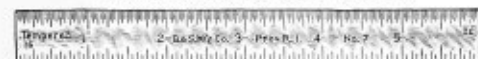
Every Rule is Marked "Tempered."

These rules are about $\frac{1}{16}$ in. thick and about $\frac{7}{16}$ in. wide, and graduated on one corner of each side only.

No.	Length, in.	Number of Graduations	Price
157	4	10, 11 or 12	\$0.45
158	6	10, 11 or 12	.65
159	9	10, 11 or 12	1.00
159A	12	10, 11 or 12	1.25

Furnished with No. 10 graduation unless otherwise ordered.

TEMPERED STEEL RULES



These Rules are about $\frac{1}{16}$ in. thick.
Every Rule is Marked "Tempered."

No.	Length, inches	Approximate Width, inches	Number of Graduations	Price
136	2	$\frac{29}{64}$	4 or 7	\$0.15
137	1	$\frac{1}{2}$	4, 7 or 9	.25
138	3	$\frac{35}{64}$	1, 2, 4, 6 or 7	.35
139	4	$\frac{19}{32}$	1, 2, 4, 6 or 7	.45
140	6	$\frac{11}{16}$	1, 2, 4, 6 or 7	.65
141	9	$\frac{63}{64}$	1, 2, 4, 6 or 7	1.00
142	12	$\frac{31}{32}$	1, 2, 4, 6 or 7	1.25
143	18	1	1, 2, 4, 6 or 7	2.00
144	24	1	1, 2, 4, 6 or 7	2.50
145	36	1	1, 2, 4, 6 or 7	5.00

TEMPERED STEEL RULES

With Patent End Graduations



These rules are furnished from 2 to 12 in. in length, and with No. 4 graduations only. They are graduated to 32nds of an inch on two ends of one side.

Prices are the same as given in the above list.
Furnished with No. 4 graduation unless otherwise ordered.

TEMPERED STEEL RULES

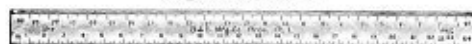
With Beveled Edges



No.	Length, inches	Approximate Width, inches	Number of Graduation	Price
136T	1	3-8	11	\$ 0.15
137T	2	3-8	11	.25
138T	3	3-8	11	.35
139T	4	3-8	11	.45
140T	6	11-16	11	.65
141T	9	53-64	10	1.00
142T	12	1	10	1.25
143T	18	1	10	2.00
144T	24	1	10	2.50

TEMPERED STEEL SHRINK RULES

English Measure



Every Rule is Marked "Tempered."

Number	Shrink per Foot, in.	Length, inches	No. of Graduation	Price
201	$\frac{1}{8}$	12 $\frac{1}{2}$	4	\$1.75
211	$\frac{1}{8}$	12 $\frac{1}{2}$	2	1.75
212	$\frac{1}{8}$	24 $\frac{1}{2}$	4	3.50
213	$\frac{1}{8}$	24 $\frac{1}{2}$	2	3.50
214	$\frac{1}{8}$	12 $\frac{1}{2}$	4	1.75
221	$\frac{1}{8}$	12 $\frac{1}{2}$	4	3.50
222	$\frac{1}{8}$	12 $\frac{1}{2}$	4	1.75
223	$\frac{1}{8}$	24 $\frac{1}{2}$	4	3.50
224	$\frac{1}{8}$	24 $\frac{1}{2}$	2	3.50
204	$\frac{1}{8}$	12 $\frac{1}{2}$	4	1.75
225	$\frac{1}{8}$	12 $\frac{1}{2}$	2	1.75
226	$\frac{1}{8}$	24 $\frac{1}{2}$	4	3.50
227	$\frac{1}{8}$	24 $\frac{1}{2}$	2	3.50
261	$\frac{1}{8}$	6 $\frac{1}{2}$	4	.75
262	$\frac{1}{8}$	6 $\frac{1}{2}$	2	.75
263	$\frac{1}{8}$	6 $\frac{1}{2}$	4	.75
264	$\frac{1}{8}$	6 $\frac{1}{2}$	4	.75
265	$\frac{1}{8}$	6 $\frac{1}{2}$	2	.75
266	$\frac{1}{8}$	6 $\frac{1}{2}$	4	.75
267	$\frac{1}{8}$	6 $\frac{1}{2}$	2	.75

Nos. 214, 221, 263, 264, 265, 266 and 267 are graduated as Standard Rules on one side and Shrink Rules on the other. The others are graduated as Shrink Rules on both sides.

6-INCH RULE WITH SLIDE



No. 364. Price, \$1.00

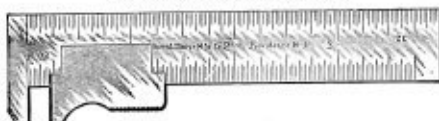
This rule is 6 in. long, about $\frac{9}{16}$ in. wide, $\frac{1}{16}$ in. thick, and furnished divided into parts of an inch as follows:

No. 1 Graduation	No. 2 Graduation
1st cor. 10, 20, 50, 100	8
2nd cor. 12, 24, 48	10, 20, 50, 100
3rd cor. 14, 28	12, 24, 48
4th cor. 16, 32, 64	16, 32, 64
No. 4 Graduation	No. 7 Graduation
1st cor. 8	16
2nd cor. 16	32
3rd cor. 32	64
4th cor. 64	100

In ordering, specify which graduation is required, otherwise No. 4 will be furnished.

SLIDE CALIPER RULE

English or Metric Measure



No. 365, English. Price, \$1.25

No. 367, Metric. Price, 1.25

The Slide Caliper Rule, shown in cut, is of steel, about $\frac{3}{16}$ in. long and $\frac{1}{16}$ in. thick. It is graduated on both corners to 32nds of an inch.

The jaws are $\frac{1}{4}$ in. deep.

The Metric rules are graduated to half-millimeters.

BROWN AND SHARPE TOOLS

STEEL CALIPER RULES
English or Metric Measure

These rules are found convenient for use in the stock room or store, in selecting sheet or bar stock, wire, tubing, etc.

They are made in two sizes, 3 in. or 75 millimeters, and 4 in. or 100 millimeters, when closed; and about $\frac{3}{8}$ in. thick. The slide of the 3 in. or 75 millimeter, can be drawn out to measure $2\frac{3}{4}$ in., or 50 millimeters; and of the 4 in. or 100 millimeter, to measure $3\frac{3}{4}$ in. or 75 millimeters.

The English rules are divided into parts of an inch as follows:

	A	B	C	D
1st cor.	8, 14, 28	8, 14, 28	8	8
2d cor.	12, 24, 48	12, 24, 48	16	16
3d cor.	16, 32, 64	16, 32, 64	32	32
4th cor.	20, 50, 100	20, 50, 100	64	64
Slide	32, & 64	64, & 100	32 & 64	64 & 100

The metric rules are graduated to millimeters and half millimeters.

No. 360. 3 inch. Price.....	\$2.00
No. 361. 4 inch. Price.....	2.50
No. 362. 75 millimeters. Price.....	2.00
No. 363. 100 millimeters. Price.....	2.50

Unless otherwise ordered "C" graduation will be furnished.

TEMPERED HOOK RULES



Every Rule is Marked "Tempered"

These Rules are found convenient for measuring diameters of flanges or circular pieces, through the hubs of pulleys, setting calipers and dividers and work of a similar character.

The hook is held rigidly in position by a clamp that is closed by the simple tightening of the knurled nut shown at the left. This construction requires no hole for attaching the hook and allows it to be clamped in any position on the rule or it can be used as a slide in measuring against a shoulder or the depth of a hole. The hook is carefully hardened.

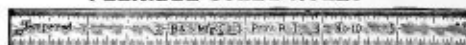
No.	Length, inches	Approximate Width, inches	Number of Graduations	Price
602	4	19-32	1, 2, 4, 6, or 7	\$0.75
603	6	11-16	1, 2, 4, 6, or 7	1.00
604	9	53-64	1, 2, 4, 6, or 7	1.40
605	12	31-32	1, 2, 4, 6, or 7	1.75
606	18	1	1, 2, 4, 6, or 7	2.50
607	24	1	1, 2, 4, 6, or 7	3.00
608	36	1	1, 2, 4, 6, or 7	5.75

NARROW TEMPERED HOOK RULES

These Rules are the same in construction as described above. They differ only in that this rule is narrow and allows measurements to be taken through a hole $\frac{3}{8}$ inch in diameter.

No.	Length, inches	Number of Graduations	Price
662	4	10, 11, or 12	\$0.70
663	6	10, 11, or 12	.90
664	9	10, 11, or 12	1.25
665	12	10, 11, or 12	1.50

FLEXIBLE STEEL RULES



Every Rule is Marked "Tempered"

Graduated on one side only.

No.	Length, inches	Approximate Width, inches	Number of Graduations	Price
149	4	$\frac{1}{8}$	10, 11, 12, 13 or 14	\$0.45
150	6	$\frac{1}{8}$	10, 11, 12, 13 or 14	.65
151	9	$\frac{1}{8}$	10, 11, 12, 13 or 14	1.00
152	12	$\frac{1}{8}$	10, 11, 12, 13 or 14	1.25
153	18	$\frac{1}{8}$	10, 11, 12, 13 or 14	2.00
154	24	$\frac{1}{8}$	10, 11, 12, 13 or 14	2.50
155	36	$\frac{1}{8}$	10, 11, 12, 13 or 14	5.00

Unless otherwise ordered No. 10 graduation will be furnished.

TRIANGULAR METALLIC SCALES



These patent triangular metallic scales are of the size and shape of the common 12 in. triangular boxwood scales. They are made from brass tubing with the ends closed, nicked with a dull finish and weigh less than $3\frac{1}{2}$ ounces.

The liability of the wood scales to crack, warp or twist, the chipping of their edges and their variation from standard measurement, are well known to all who have used them. These objections we have overcome in the new scales. The ends of these scales are covered with hardened steel plates which slightly raise the scales from the paper.

No. 63 M. 12 in., divided to scales of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3 and 4 inches to the foot and 16ths of an inch.

Price, each.....\$2.50

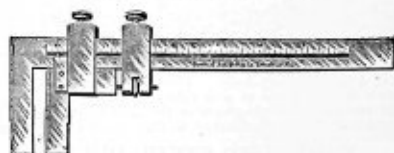
No. 64 M. 12 in., divided to scales of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3 and 4 inches to the foot and 16ths of an inch.

Price, each.....\$2.50

No. 73 M. 12 in., divided on one edge to 10ths, 20ths, 30ths, 40ths, 50ths and 60ths of an inch; or to 20ths, 30ths, 40ths, 50ths, 60ths, and 80ths of an inch. Price, each.....\$2.50

In ordering No. 73 M, state whether the divisions 10 to 60 or 20 to 80 are wanted.

CALIPER SQUARES



These caliper squares are graduated on one side to 64ths and the other side to 100ths of an inch.

They are furnished with and without adjusting screws. The 4 in., 6 in., and 9 in. caliper squares take inside as well as outside measurements.

The 4 in. caliper square is also made graduated to read to $\frac{1}{2}$ millimeters instead of 64ths of an inch.

The 6 in. and 9 in. caliper squares have hardened jaws.

No.	Price without Adjusting Screw	Price with Adjusting Screw	Size, inches	Length of Jaws, inches	Width of Jaws Closed, inches
700	\$2.25	\$ 3.50	2	$\frac{3}{4}$	...
702	3.50	4.50	4	$1\frac{1}{2}$	$\frac{1}{2}$
704	5.50	7.50	6	2	1
706	9.00	11.00	9	$3\frac{1}{4}$	1

BROWN & SHARPE TOOLS

KEY SEAT RULES



Parallel lines for key seats, mortises, etc., can be readily and accurately drawn with these rules on shafts not less than $\frac{3}{8}$ inch in diameter.

The edges are beveled and graduated to 32ds of an inch.

No.	Length, inches	Price
254	4	\$2.50
256	6	3.00
258	8	3.75

STEEL RULES WITH HOLDER



The Rules and Holder are convenient where the ordinary rule cannot be used, as in measuring a recess or keyway, as well as the general class of tool and die work.

The holder takes either of the five sizes of rules. The barrel is knurled for finger grip. The rules are held in a split chuck, adjusted by a knurled nut at the top of the barrel, and can be set at various angles according to the work.

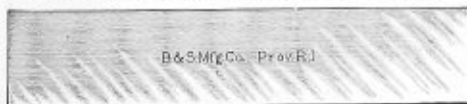
The rules are of tempered steel, graduated on both sides as follows: 32ds on one side and 64ths on the other, or 50ths on one side and 100ths on the other.

Five Rules Interchangeable in One Holder

No.	Length, inches	Without Holder	With Holder
247	$\frac{1}{4}$	\$0.20	\$0.70
248	$\frac{3}{8}$	.20	.70
249	$\frac{1}{2}$	.20	.70
250	$\frac{3}{4}$	.20	.70
251	1	.20	.70

No. 252. Holder Price \$0.50
Set Complete, Holder and 5 rules 1.50

HARDENED STEEL STRAIGHT EDGES



These straight edges are like the tongues of the hardened steel try squares and are hardened on the edge only.

No.	Length, inches	Width, inches	Approximate Thickness, inches	Price Each
420	$3\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	\$0.60
422	$5\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	1.00
424	7	$\frac{1}{8}$	$\frac{1}{8}$	1.25
426	$10\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	2.00
428	14	$\frac{1}{8}$	$\frac{1}{8}$	3.00
430	17	$\frac{1}{8}$	$\frac{1}{8}$	3.50
432	20	$\frac{1}{8}$	$\frac{1}{8}$	4.50
434	27	$\frac{1}{8}$	$\frac{1}{8}$	7.00
436	33	$\frac{1}{8}$	$\frac{1}{8}$	9.00
438	39	$\frac{1}{8}$	$\frac{1}{8}$	12.00

STANDARD STEEL STRAIGHT EDGES



These straight edges are made from the best quality of steel; and every care is taken to insure their being straight.

No.	Length, inches	Width, inches	Approximate Thickness, inches	Price
370	6	1	$\frac{5}{16}$	\$0.60
372	9	$1\frac{1}{8}$	$\frac{5}{16}$	.90
374	12	$1\frac{1}{4}$	$\frac{5}{16}$	1.25
376	18	$1\frac{1}{2}$	$\frac{5}{16}$	2.00
378	24	2	$\frac{5}{16}$	2.75
380	36	$2\frac{1}{2}$	$\frac{5}{16}$	5.00
382	48	3	$\frac{5}{16}$	8.00
384	60	3	$\frac{5}{16}$	12.00
386	72	3	$\frac{5}{16}$	16.00

BEVELED STEEL STRAIGHT EDGES



The beveled edge is 1-16 inch thick. Only one edge is beveled.

No.	Length, inches	Width, inches	Approximate Thickness, inches	Price
400	12	$1\frac{3}{8}$	$\frac{3}{16}$	\$1.50
402	18	$1\frac{3}{4}$	$\frac{3}{16}$	2.50
404	24	2	$\frac{3}{16}$	3.50
406	36	3	$\frac{3}{16}$	6.00
408	48	3	$\frac{3}{16}$	10.00
410	60	3	$\frac{3}{16}$	15.00
412	72	$3\frac{1}{8}$	$\frac{3}{16}$	20.00

AUTOMATIC CENTER PUNCHES



The tool is of steel entirely self-contained, the striking mechanism being enclosed in the knurled handle, which is of such a size and form as to be held conveniently in the hand.

A downward pressure releases the striking block and makes the impression.

The points can be taken out for grinding and are easily replaced if broken.

No. 614. $5\frac{1}{4}$ inches long, $\frac{5}{16}$ inch in diameter.

Price, each \$1.50

No. 615. 6 inches long, $\frac{5}{16}$ inch in diameter.

Price, each 2.50

No. 615 differs from 614 in being slightly heavier in construction and capable of striking a much heavier blow.

No. 616. Pocket

This is similar to Nos. 614 and 615, but made small and light for the more delicate work required in tool making.

No. 616. $4\frac{1}{4}$ inches long, $\frac{5}{16}$ inch in diameter.

Price, each \$1.25

No. 617. Adjustable

This is similar to Nos. 614 and 615, but has an adjustable stroke.

No. 617. $5\frac{1}{4}$ inches long, $\frac{5}{16}$ inch in diameter. Price each \$2.00

BROWN & SHARPE TOOLS

DIAL TEST INDICATOR
English or Metric Measure

Especially serviceable in erecting or inspecting machines to determine any inaccuracy in a surface or in the movement of a spindle, arbor, etc. Parts are adjustable to any angle. Arm can be removed from the post and used independently. Points are removable to permit use of different forms. The movement of the measuring surface that bears upon the work is magnified a number of times and indicated by the pointer. The dial, about 1 3/4 in. in diameter, reads to .001 in., has a white enamel face and is adjustable to allow the setting of the zero to any required position.

The spindle has a movement of 1/4 in. The base is 8 in. long; the post 9 in. high.

Stops for use on the under side of the base, a split block and an angular post are furnished.

Each tool is packed in a substantial box fitted to hold the various parts when not in use.

Metric Measure. Also made with metric Dial and reads to 1-100 m. m.

No. 474, English Measure.....\$20.00
No. 475, Metric Measure.....20.00

B. & S. INDICATOR
Universal Movement

For setting centrally any point or hole in a piece of work to be operated upon in a lathe or upon a face-plate, testing lathe centers, shafting and other work held between centers and the inside and outside diameters of pulleys, etc. Shank is made of hardened steel designed to be held in the tool post of a lathe. Indicator point is of hardened steel, made spherical to allow pressure to be brought upon it by the work from any angle. Scale is graduated to 1000ths of an inch and reads .001 in. either side of zero.

Price.....\$5.75

B. & S. SCRIBERS



No. 535, Single Point, 5 inches long.....\$0.30
No. 536, Double......35

These Scribers are made with the intention that they shall be a little better than the ordinary requirements of such a tool demand.

The points are of tool steel, finely tempered. They are threaded to screw into the holder and knurled for a finger grip. The knurled holder has long bearings to support the points firmly when in place and is of a suitable size to be held conveniently.

The Single Point Scriber is convenient for ordinary use, when a double point is not required. The holder is knurled and the point held as described above.

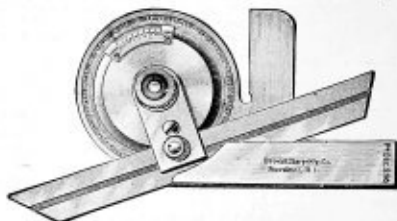
LATHE TEST INDICATOR



The Lathe Test Indicator is new in design and is for use in setting centrally any point or hole in a piece of work to be operated upon in a lathe or upon a face plate. It is also well adapted for testing lathe centers, shafting or other work held between centers, the inside or outside of cylinders, pulleys, etc., and all work of a similar class.

No. 467, Each.....\$3.00

IMPROVED UNIVERSAL BEVEL PROTRACTOR



This Protractor is well adapted for all classes of work where angles are to be laid out or established. Its uses as a protractor are practically unlimited.

One side of the stock is flat, thus permitting its being laid flat upon the paper for work.

No. 495, Protractor with 6-inch blade.....Price, \$ 8.00
In Morocco Case.....9.00
No. 496, Protractor with 12-inch blade.....9.00
In Morocco Case.....10.50
Extra Blades, 6-inch......75
Extra Blades, 12-inch.....1.75

IMPROVED UNIVERSAL BEVEL

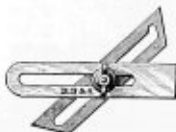


This cut represents an Improved Universal Bevel, 3 inches long, with an offset blade that admits of the measurement of all angles.

The case is solid on the top for 1 1/2 inches from the square end.

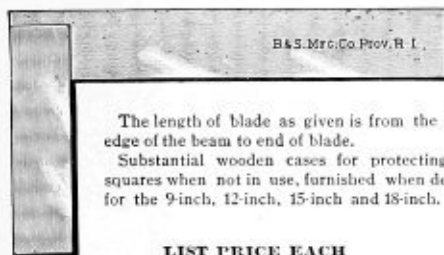
No. 483, Price.....\$1.50

UNIVERSAL BEVELS



No.	Price	Length of Head and Tongue, Inches	Width of Head and Tongue, Inches
480	\$1.25	3	5/8
482	1.25	1 1/4	1/4

HARDENED CAST STEEL TRY SQUARES



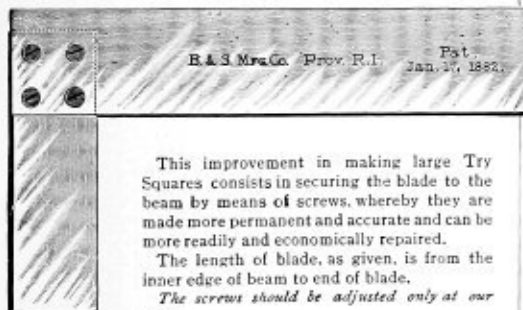
The length of blade as given is from the inner edge of the beam to end of blade.

Substantial wooden cases for protecting the squares when not in use, furnished when desired for the 9-inch, 12-inch, 15-inch and 18-inch.

LIST PRICE EACH

No.	Length of Blade, inches	Length of Beam, inches	Price	Price of Case
550	1½	1½	\$ 1.75	.....
552	3	2½	2.50	.....
554	4½	3½	3.50	.....
555	6	4½	4.50	.....
556	9	5½	6.50	\$0.50
557	12	7½	9.00	.75
558	15	8½	15.00	1.00
560	18	10½	18.00	1.50

IMPROVED HARDENED CAST STEEL TRY SQUARES



This improvement in making large Try Squares consists in securing the blade to the beam by means of screws, whereby they are made more permanent and accurate and can be more readily and economically repaired.

The length of blade, as given, is from the inner edge of beam to end of blade.

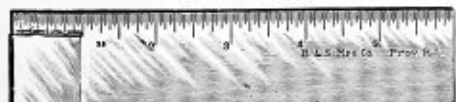
The screws should be adjusted only at our works.

Substantial wood cases furnished with these squares.

Number	Length of Blade, inches	Length of Beam, inches	Price Each
570	24	13½	\$30.00
572	30	16½	40.00
574	36	19½	50.00

GRADUATED STEEL SQUARES

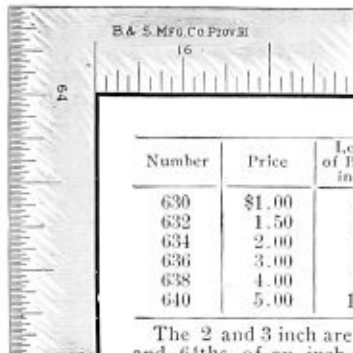
Not Hardened



The length of blade, as given, is the extreme length over all.

Substantial Wooden Cases for protecting the Squares when not in use, furnished when desired, for the 9 in. and 12-in.

No.	Length of Blade, in.	Length of Beam, in.	Price Each	Price of Case
590	3	2	\$2.00	.....
592	4	2½	2.50	.....
594	6	3½	3.50	.....
596	9	5	6.00	\$0.50
598	12	6½	7.00	.75



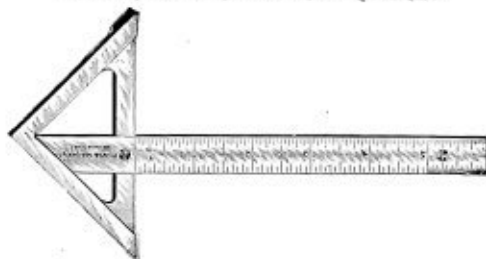
THIN STEEL SQUARES

Number	Price	Length of Blades, inches	Width of Blades, inches
630	\$1.00	2	½
632	1.50	3	¾
634	2.00	4	¾
636	3.00	6	1
638	4.00	8	1½
640	5.00	10	1½

The 2 and 3 inch are divided to 16ths and 64ths of an inch on one side and 32nds and 64ths on the other.

The 4, 6, 8 and 10 inch are divided on both sides to 16ths and 32nds of an inch.

UNIVERSAL OR CENTRE SQUARES



Four inch blade 1st cor. 32nds, 2nd cor. 20ths.

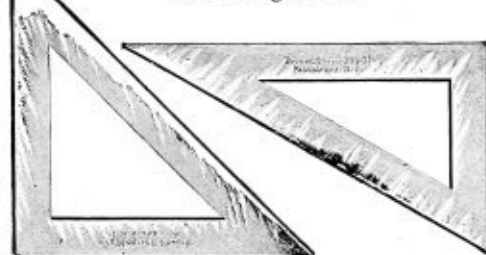
6, 8, 10 and 12 in. blade, 1st cor. 16ths, 2nd cor. 12ths.

Last inch, 1st cor. 32nds, 2nd cor. 48ths.

No.	Price	Length of Blade, inches	Length of Head, inches
650	\$2.00	4	3
652	2.50	6	4
654	3.50	8	5½
656	5.00	10	7
658	6.00	12	8¼

OPEN STEEL TRIANGLES

For Draughtsmen



No.	Angles, degrees	Length of Sides, inches	Width of Sides, inches	Price
540	30 60 90	6 10½ 12	¾	\$4.00
542	30 60 90	3½ 6½ 7	¾	3.00
544	45 45 90	8 8 11¼	¾	4.00
546	45 45 90	5 5 7¼	¾	3.00

BROWN & SHARPE TOOLS

AMERICAN STANDARD WIRE GAUGE

Adopted by the Brass Manufacturers, Jan., 1858



These Gauges are made from the best steel, and are tempered, adjusted, and warranted accurate.

None genuine unless stamped as in the engraving with our trade marks.

No. 730. Sizes 0 to 36.....\$2.50
No. 732. Sizes 5 to 36.....2.00

In order to familiarize the users of the gauge with the decimal equivalents of the gauge numbers, we furnish No. 732 with these decimal equivalents expressed in thousandths, stamped on the back, opposite to the regular gauge numbers.

ENGLISH STANDARD WIRE GAUGE

The Same as Stubbs' Wire or Birmingham Gauge

No. 734. 1 to 36..\$2.00..No. 736. 6 to 36..\$1.50

WASHBURN & MOEN STANDARD WIRE GAUGE

No. 737. Sizes 0 to 36. Price.....\$2.50

This gauge is $3\frac{1}{4}$ inch in diameter, and about $\frac{1}{8}$ inch thick. It is made from the best steel, tempered, adjusted and all sizes tested after hardening.

U. S. STANDARD GAUGE

No. 740. Price.....\$2.50

This Gauge is $3\frac{1}{4}$ inches in diameter and about $\frac{1}{8}$ inch thick. The Gauge numbers, which run from 0 to 36, are those of the U. S. Standard Gauge for Sheet and Plate Iron and Steel, adopted by Congress, March 3, 1893.

DEPTH OF GEAR TOOTH GAUGES



Price, each.....\$0.25
Price, sizes to 3 in pitch, made to order, each.. .75
Larger sizes.....1.25

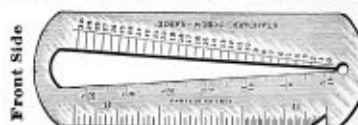
Depth of Gear Tooth Gauges for all regular pitches, from 3 to 48 pitch inclusive, are carried in stock. One gauge answers for each pitch and indicates the extreme depth to be cut.

DIFFERENT STANDARDS FOR WIRE GAUGE IN USE IN THE UNITED STATES

Dimensions of Sizes in Decimal Parts of an Inch

Number of Wire Gauge	American or Stubbs' Wire	Birmingham or Stubbs' Wire	Washburn & Moen Mfg. Co., Worcester, Mass.	Imperial Wire Gauge	Stubbs' Wire	U. S. Standard for Plate
000000				.464		.46875
00000				.432		.4375
0000	.46	.454	.3938	.400		.40625
000	.40964	.425	.3625	.372		.375
00	.3648	.38	.3310	.348		.34375
0	.32486	.34	.3065	.324		.3125
1	.2893	.3	.2830	.300	.227	.28125
2	.25763	.284	.2625	.276	.219	.265625
3	.22942	.259	.2437	.252	.212	.25
4	.20431	.238	.2253	.232	.207	.234375
5	.18194	.22	.2070	.212	.204	.21875
6	.16202	.203	.1920	.192	.201	.203125
7	.14428	.18	.1770	.176	.199	.1875
8	.12849	.165	.1620	.160	.197	.171875
9	.11443	.148	.1483	.144	.194	.15625
10	.10189	.134	.1350	.128	.191	.140625
11	.090742	.12	.1205	.116	.188	.125
12	.080808	.109	.1055	.104	.185	.109375
13	.071961	.095	.0915	.092	.182	.09375
14	.064084	.083	.0800	.080	.180	.078125
15	.057068	.072	.0720	.072	.178	.0703125
16	.050982	.065	.0625	.064	.175	.0625
17	.045257	.058	.0540	.056	.172	.05625
18	.040303	.049	.0475	.048	.168	.05
19	.03589	.042	.0410	.040	.164	.04375
20	.031961	.035	.0348	.036	.161	.0375
21	.028462	.032	.03175	.032	.157	.034375
22	.025347	.028	.0286	.028	.155	.03125
23	.022571	.025	.0258	.024	.153	.028125
24	.0201	.022	.0230	.022	.151	.025
25	.0179	.02	.0204	.020	.148	.021875
26	.01594	.018	.0181	.018	.146	.01875
27	.014195	.016	.0173	.0164	.143	.0171875
28	.012641	.014	.0162	.0149	.139	.015625
29	.011257	.013	.0150	.0136	.134	.0140625
30	.010025	.012	.0140	.012	.127	.0125
31	.008928	.01	.0132	.0116	.120	.0109375
32	.00795	.009	.0128	.0108	.115	.01015625
33	.00708	.008	.0118	.0100	.112	.0090875
34	.006304	.007	.0104	.0092	.110	.00859375
35	.005614	.005	.0095	.0084	.108	.0078125
36	.005	.004	.0090	.0076	.106	.00703125
37	.004453			.0068	.103	.006640625
38	.003963			.0060	.101	.00625
39	.003531			.0052	.099	
40	.003144			.0048	.097	

POCKET SCREW AND WIRE GAUGES



This Gauge as shown is an angular gauge graduated on the front, on the left of slot, to show all sizes of the American standard screw gauge from 0 to 30, and is designed for the measurement of wire as well as of machine and wood screws.

In addition to the gauge numbers, the front side of the Gauge is also graduated on the left of slot to 32nds of an inch.

The back side of the Gauge is graduated as the old or English wire gauge, from 17 to 0000 on the right, and the new or American wire gauge from 15 to 0000 on the left of slot.

No. 760. Price.....\$2.50

BROWN & SHARPE TOOLS

No. 20 SCREW PITCH
GAUGE

22 Pitches

This Screw Pitch Gauge will measure the threads of nuts as well as of screws and contains the pitches 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, on one end, and 22, 24, 26, 27, 28, 30, 32, 34, 36, 38 and 40, on the other end. Price, each \$1.00

No. 21 SCREW PITCH GAUGE

This Screw Pitch Gauge is the same in design as No. 20. It contains 24 blades with pitches 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½ and 12, on one end, and 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, and 30, on the other. Price, each \$1.00

No. 766 U. S. S. SCREW PITCH GAUGE

This Screw Pitch Gauge is the same in design as No. 20. It contains 26 blades with pitches, 2¼, 2½, 2¾, 2⅝, 2⅞, 3, 3¼, 3½, 4, 4½ and 5, on one end, and 5½, on the other. Price, each \$1.50

No. 22 SCREW PITCH
GAUGE

22 Pitches

This Screw Pitch Gauge, shown in full size, is designed especially to meet the requirements of bicycle manufacturers, electricians and others using screws with fine V-threads.

The Gauge contains 22 blades with pitches 32, 34, 36, 38, 40, 42, 44, 46, 48, 50 and 52 on one end and 54, 56, 58, 60, 62, 64, 66, 68, 70, 72 and 74 on the other. Price, each \$1.00

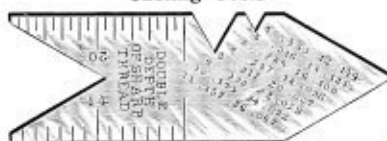
THICKNESS GAUGES



No. 781

This Gauge consists of a set of 22 steel blades, varying in thickness from .004 to .025 of an inch, by thousandths. These blades may be used singly or in combination, as may be desired. Plain figures, easily read, indicate the thickness of each blade. Price, each \$1.50

No. 782. This Gauge is similar in design to No. 781 and consists of a set of nine steel blades, .0015, .002, .003, .004, .006, .008, .010, .012 and .015 of an inch in thickness. Price, each \$1.25

CENTRE GAUGES
And Gauges for Grinding and Setting Screw
Cutting Tools

Full Size

With table for determining the size of tap drills for 60° V threads.

U. S. Standard, 60°

No. 510. Price...\$0.25 No. 511. Tempered, Price...\$0.35

Whitworth or English Standard, 55°

No. 512. Price...\$0.25 No. 513. Tempered, Price...\$0.35

Metric, 60°

No. 508. Price...\$0.25 No. 509. Tempered, Price...\$0.35

STEEL MUSIC WIRE GAUGE
Washburn & Moen Standard

Full Size

No. 738. Price, each \$1.50

BROWN & SHARPE TOOLS

"B & S" PROTRACTORS
With Reversible Heads**WITH TEMPERED BLADES**

No.	Size, inches.	Price.
25 C	9	\$3.50
25 D	12	3.75

Price, Protractor Head With Level, \$2.50**WITH TEMPERED BLADES**

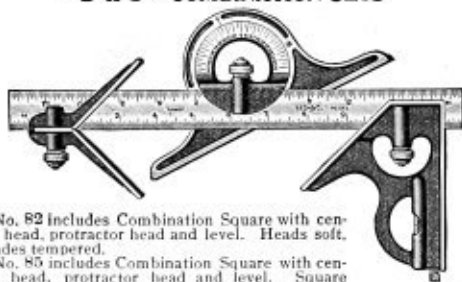
No.	Size, inches.	Price.
26 E	18	\$5.50
26 F	24	6.25

This Protractor differs from No. 25 only in having an extra heavy blade and a heavy Reversible Head about 9 inches long and 1 inch thick.

Price, Heavy Protractor Head With Level, \$3.00

The blades are divided into parts of an inch, as follows:

	No. 1 Grad.	No. 2 Grad.	No. 4 Grad.	No. 7 Grad.
1st corner,	10, 20, 50, 100	8	8	16
2d "	12, 24, 48	10, 20, 50, 100	16	32
3d "	14, 28	12, 24, 48	32	64
4th "	16, 32, 64	16, 32, 64	64	100

"B & S" COMBINATION SETS

No. 82 includes Combination Square with centre head, protractor head and level. Heads soft, blades tempered.

No. 85 includes Combination Square with centre head, protractor head and level. Square heads hardened, blades tempered.

With Soft Heads and Tempered Blades **With Square Heads Hardened and Tempered Blades**

No.	Size, in.	Price.	No.	Size, in.	Price.
82 C	9	\$4.25	85 C	9	\$4.75
82 D	12	4.50	85 D	12	5.00
82 E	18	5.25	85 E	18	5.75
82 F	24	5.75	85 F	24	6.25

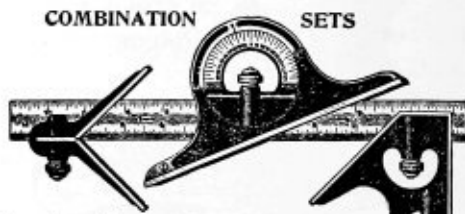
With Soft Heads and Tempered Blades **With Square Heads Hardened and Tempered Blades**

No.	Size, in.	Price.	No.	Size, in.	Price.
84 E	18	\$6.50	87 E	18	\$7.25
84 F	24	7.25	87 F	24	8.00

Nos. 84 and 87 differ from Nos. 82 and 85 only in having extra heavy blades, the Square Heads the same as those on Combination Squares Nos. 50 and 61 and the Protractor Heads 9 inches long and 1/2 inch thick.

The blades are divided into parts of an inch, as follows:

	No. 1 Grad.	No. 2 Grad.	No. 4 Grad.	No. 7 Grad.
1st corner,	10, 20, 50, 100	8	8	16
2d "	12, 24, 48	10, 20, 50, 100	16	32
3d "	14, 28	12, 24, 48	32	64
4th "	16, 32, 64	16, 32, 64	64	100

COMBINATION SETS

These Sets differ from Nos. 82, 84, 85 and 87 only in having the Reversible Protractor Head.

No. 92

With Soft Heads and Tempered Blades.

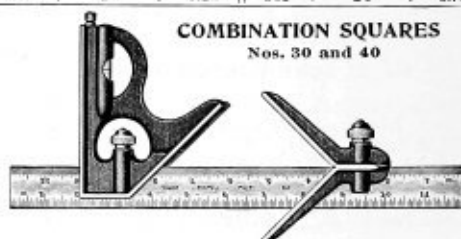
No. 95

With Square Heads Hardened and Tempered Blades.

No.	Size, inches.	Price.	No.	Size, inches.	Price.
92 C	9	\$4.75	95 C	9	\$5.25
92 D	12	5.00	95 D	12	5.50
92 E	18	5.75	95 E	18	6.25
92 F	24	6.25	95 F	24	6.75

COMBINATION SQUARES

Nos. 30 and 40



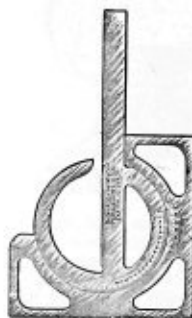
With Hardened Heads and Tempered Blades.

With Soft Heads and Tempered Blades.

No.	Size in.	With Ce'r'r Head	No.	Size in.	With-out Center Head	No.	Size in.	With Ce'r'r Head	No.	Size in.	With-out Ce'r'r Head
30B	6	\$2.50	30H	4	\$1.50	40B	6	\$2.00	40H	4	\$1.25
30C	9	2.75	30C	9	2.25	40C	9	2.25	40C	9	1.75
30D	12	3.00	30F	12	2.50	40D	12	2.50	40F	12	2.00
30E	18	3.75	30R	18	3.25	40E	18	3.25	40R	18	2.75
30F	24	4.25	30S	24	3.75	40F	24	3.75	40S	24	3.25

The blades are divided into parts of inches as follows:

	No. 1 Grad.	No. 2 Grad.	No. 4 Grad.	No. 7 Grad.
1st corner,	10, 20, 50, 100	8	8	16
2d corner,	12, 24, 48	10, 20, 50, 100	16	32
3d corner,	14, 28	12, 24, 48	32	64
4th corner,	16, 32, 64	16, 32, 64	64	100

DRAUGHTSMEN'S PROTRACTOR

This Protractor can be quickly set to any angle. It can be used either side up and on either of the two straight edges and it is of advantage in dividing a circle, transferring angles or laying off a given angle, without resetting, on either side of a line.

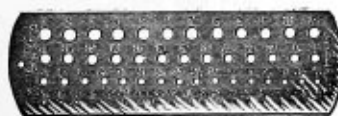
The Vernier reads to 5 minutes.

It forms a convenient extension to T square and frequently takes the place of 45 degree and 60 degree triangles.

Price, without case.....\$6.50
Price, with case.....\$7.25

BROWN & SHARPE TOOLS

TWIST DRILL AND STEEL WIRE GAUGES



No. 774. Gauge Nos. from 1 to 60...each, \$1.50
No. 776. Gauge Nos. from 61 to 80...each, 2.00

STANDARD SCREW THREAD GAUGE



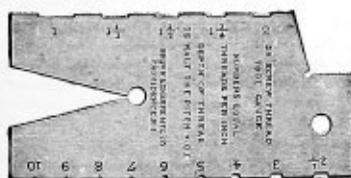
No. 825 Full Size

This Gauge is to be used as a standard for grinding tools to cut threads according to the United States Standard.

The angles are 60 degrees and the flat surfaces at top and bottom of threads are equal to one-eighth of the pitch. Price, each \$2.00

IMPROVED 20° SCREW THREAD TOOL GAUGE

"Acme Standard"

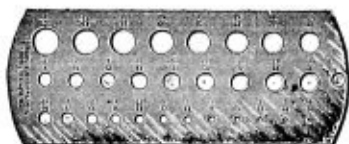


This Gauge furnishes a correct standard to which tools can be ground to cut threads, of a uniform angle, to take the place of square threads.

This Gauge is made of the best steel, tempered, adjusted, and all angles accurately tested after hardening.

No. 829. Price, each \$2.50

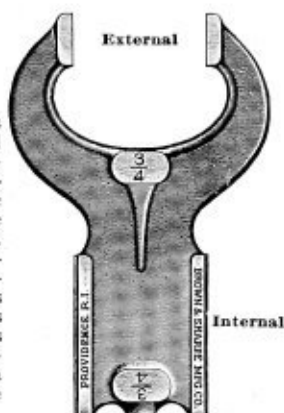
JOBBER'S' DRILL GAUGE



No. 780. Gauge $\frac{1}{16}$ to $\frac{1}{2}$ inch. Price, each, \$2.25

STANDARD CALIPER GAUGES

These Gauges are hardened and ground accurately, one end for outside and the other for inside measurement. By their use mistakes in the setting of calipers and variations in measurements by different workmen will be in a great measure avoided.



Size, In.	PRICES			Size, In.	PRICES			Size, In.	PRICES		
	Both Ends	Single End	Finished		Both Ends	Single End	Finished		Both Ends	Single End	Finished
$\frac{1}{16}$	\$2.50	\$1.40		$1\frac{1}{8}$	\$2.85	\$1.55		$2\frac{1}{8}$	\$4.00	\$2.20	
$\frac{3}{16}$	2.50	1.40		$1\frac{1}{4}$	2.90	1.60		$2\frac{1}{4}$	4.10	2.30	
$\frac{1}{8}$	2.50	1.40		$1\frac{3}{8}$	2.95	1.60		$2\frac{3}{8}$	4.20	2.30	
$\frac{5}{16}$	2.50	1.40		$1\frac{1}{2}$	3.00	1.65		$2\frac{1}{2}$	4.30	2.30	
$\frac{3}{8}$	2.50	1.40		$1\frac{5}{8}$	3.05	1.65		$2\frac{5}{8}$	4.40	2.40	
$\frac{7}{16}$	2.50	1.40		$1\frac{3}{4}$	3.10	1.70		$2\frac{7}{8}$	4.50	2.40	
$\frac{1}{2}$	2.50	1.40		$1\frac{7}{8}$	3.20	1.75		$2\frac{1}{2}$	4.60	2.50	
$\frac{9}{16}$	2.50	1.40		$1\frac{1}{2}$	3.30	1.80		$2\frac{3}{4}$	5.00	2.80	
$\frac{5}{8}$	2.50	1.45		$1\frac{5}{8}$	3.40	1.90		$2\frac{5}{8}$	5.25	2.90	
$\frac{11}{16}$	2.55	1.45		$1\frac{3}{4}$	3.50	2.00		$2\frac{7}{8}$	5.50	3.00	
$\frac{3}{4}$	2.60	1.45		$1\frac{7}{8}$	3.60	2.00		$2\frac{1}{2}$ to $2\frac{3}{4}$	6.00	3.30	
$\frac{7}{8}$	2.65	1.45		$1\frac{1}{2}$	3.70	2.10		$2\frac{3}{4}$	6.00	3.30	
1	2.70	1.50		$1\frac{5}{8}$	3.80	2.10		3	6.50		
$1\frac{1}{16}$	2.75	1.50		2	3.90	2.20					
$1\frac{1}{8}$	2.80	1.55		$2\frac{1}{8}$	3.95	2.20					

The Following Sizes are Made in Two Parts

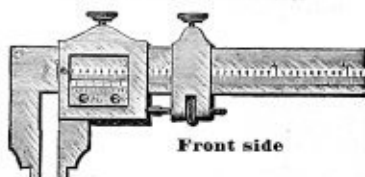
Size, In.	Price, Both Parts	Price, One Part	Size, In.	Price, Both Parts	Price, One Part
3 to $3\frac{1}{4}$	\$6.50	\$3.25	$4\frac{1}{8}$ to 5	\$8.50	\$4.25
$3\frac{1}{2}$ to $3\frac{3}{4}$	7.00	3.50	$5\frac{1}{8}$ to 6	9.00	4.50
$3\frac{7}{8}$ to $3\frac{1}{2}$	7.50	3.75	$6\frac{1}{8}$ to 7	9.50	4.75
$3\frac{3}{4}$ to 4	8.00	4.00	$7\frac{1}{8}$ to 8	10.00	5.00

External End Only

Size, In.	Price	Size, In.	Price
$8\frac{1}{8}$ in. to 9 in.	\$5.65	10 $\frac{1}{8}$ in. to 11 in.	\$7.00
$9\frac{1}{8}$ in. to 10 in.	6.25	11 $\frac{1}{8}$ in. to 12 in.	8.00

BROWN & SHARPE TOOLS

VERNIER CALIPERS



Front side

These Calipers are graduated on the front to read, by means of a vernier, to thousandths of an inch. They are graduated on the back to 64ths of an inch. The jaws are hardened and ground and take inside as well as outside measurements. Points are placed on the bars and slides so that dividers can be set to transfer distances.

These Calipers are also furnished graduated on one side to read to 1-50th of a millimeter and to .001 of an inch on the other. An explanation of the vernier is sent with each caliper.

No.	Size, Inches	Length of Jaws, Inches	Width of Jaws Closed, Inches	Price in Case
682	6	1 1/4	3/4	\$15.00
686	12	2 1/4	3/8	20.00
688	24	2 1/4	3/8	25.00

A STANDARD is furnished when desired for testing the accuracy of the adjustment of the Calipers.

Price.....\$3.00

UNIVERSAL SURFACE GAUGES

Heavy Base



Patented July 11, 1905.

These Surface Gauges differ from Nos. 861 and 862 in that the base is much larger and heavier. The base is 4 inches long and weighs about 3 1/2 lbs. For small work, the spindle can be removed and the scriber inserted in a hole provided where it can be adjusted.

Price

No. 870. With 12-inch Spindle.....	\$3.00
No. 871. With 12-inch and 18-inch Spindles.....	3.50

UNIVERSAL SURFACE GAUGES

Patented July 11, 1905.

A reliable tool for accurate and complicated measurements.

The base is solid, carefully case hardened, and of a form most convenient to hold. The bases of these gauges have, in addition to the V shaped groove in the end, a corresponding groove in the bottom, adapting the gauges for use in cylindrical work, and are provided with two gauge pins in rear end of base that can be pushed down and used against edge of plate or side of T slot.

The post swivels can be set and rigidly clamped in any position from the vertical to the horizontal, and the scriber used below the base as a depth gauge.

The scriber has a fine adjustment that can be used after the sliding block is set at the approximate height. This device is simple and cannot get out of order. The adjustment is made by means of the large knurled nut, shown in cut, which, when turned, revolves the scriber clasp slowly and continuously and allows the scriber to be set at any position within its range.

No. 860. Tool Makers.....	Price \$2.50
No. 861. 9-inch.....	2.50
No. 862. 12-inch.....	3.00

SPACING ATTACHMENT

For Use with Automatic Center Punches, Nos 614 and 617



This Attachment is new in design and can be quickly attached to the Automatic Center Punch. It is useful in quickly and accurately spacing or laying out work to be machined or drilled. When adjusted for use, the attachment is screwed on to the center punch in place of the removable point.

The fine adjustment of the locating point is obtained by the screw at the end of the beam and the quick adjustment by pulling out the knob at the top of the post.

The point is held by a knurled check nut and can be adjusted to varying lengths.

No. 612. Spacing Attachment.....	Price \$2.00
Extra Points for Attachment.....each,	.15



TOOL MAKERS' CLAMPS



These Clamps are designed and proportioned throughout to insure the greatest strength and rigidity. They are made of steel, carefully hardened and nicely mottled for a finish. The jaws are rounded on the ends to allow clamping under a shoulder or recess. The screws are of comparatively fine pitch to give ample leverage. They fit the jaws sufficiently tight to insure rigidity.

Prices

No.	Opening of Jaws, Inches	Price Each
840	9/16	\$0.45
841	1	.50
842	1 1/8	.65
843	1 1/4	.75
844	2 1/8	1.00

BROWN & SHARPE TOOLS

TOOL MAKERS' DIVIDERS



Entirely new in design. The fulcrum stud is hardened and spring is unusually stiff—of such construction that insures rigidity.

No.	Size, Inches	Price
975	2	\$1.00
977	3	1.25
979	4	1.50
981	5	1.50
981A	6	1.75

TOOL MAKERS' CALIPERS



Outside



Inside

No.	Size, Ins.	Price	No.	Size, Ins.	Price
983	2	\$1.00	991	2	\$1.00
985	3	1.25	993	3	1.25
987	4	1.50	995	4	1.50
989	5	1.50	997	5	1.50
989A	6	1.75	999	6	1.75

B. & S. STANDARD CALIPERS

With Spring Nut

Size, Ins.	Outside No.	Inside No.	Price
2½	920	...	\$1.15
3	922	940	1.15
4	924	942	1.25
5	926	944	1.25
6	928	946	1.50

With Solid Nut

Size, Ins.	Outside No.	Inside No.	Price
2½	921	...	\$1.00
3	923	941	1.00
4	925	943	1.10
5	927	945	1.10
6	929	947	1.35



Outside

B. & S. STANDARD DIVIDERS

With Spring Nut

No.	Size, Inches	Price
948	2½	\$1.15
950	3	1.15
952	4	1.40
954	5	1.40
956	6	1.75

With Solid Nut

No.	Size, Inches	Price
949	2½	\$1.00
951	3	1.00
953	4	1.25
955	5	1.25
957	6	1.60



THREAD AND KEY-HOLE CALIPERS



Thread
With Spring Nut



Key-Hole
With Solid Nut

Size, Inches	Price Thread	Price Key-Hole	Size, Inches	Price Thread	Price Key-Hole
3	\$1.15	\$1.15	3	\$1.00	\$1.00
4	1.25	1.25	4	1.10	1.10
5	1.25	...	5	1.10	...

THE SPRING NUT

The Spring Nut is a Spring Chuck with hardened jaws. It is positive in action when closing, the thread engaging the hardened screw on the slightest pressure. When the pressure is withdrawn, it slides freely on the screw.

FIRM JOINT CALIPERS

Tempered

Size, Inches	Price
3	\$0.40
4	.50
5	.55
6	.65
8	.80
10	.90
12	1.00
14	1.50
16	1.75
18	2.10
20	2.50
24	3.00



Outside



Inside

BROWN & SHARPE TOOLS

SCREW ADJUSTING FIRM JOINT CALIPERS

Tempered



Outside

Size, Inches	Price
4	\$0.90
5	.95
6	1.00
8	1.25
10	1.50
12	1.75
14	2.00
16	2.25
18	2.50
20	2.75
24	3.50



Inside

TRANSFER FIRM JOINT CALIPER

Tempered



Outside

Size, Inches	Price
4	\$1.10
5	1.25
6	1.35
8	1.60
10	1.85
12	2.10
14	2.35
16	2.60
18	2.85
20	3.35
24	4.10



Inside

HERMAPHRODITE FIRM JOINT CALIPER

Tempered



With Adjustable Point		With Solid Point	
Size, Inches	Price	Size, Inches	Price
4	\$0.65	4	\$0.50
6	.80	6	.65
8	1.00	8	.80

IMPROVED STEEL BEAM TRAMMELS

The adjustable points are held by spring chucks and can be removed easily and replaced by pencil or other special points.

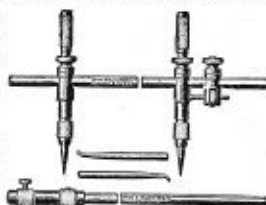
A pair of calipering points is furnished with these trammels.

With the beam regularly furnished, the trammels will describe a circle 26 inches in diameter.

EXTENSION BEAM. An extension beam that will allow the trammels to describe a circle 54 inches in diameter is furnished when desired. Price, 50 cents.

Trammels are sent without extension beam unless otherwise ordered.

No. 852. Each \$3.00
With Extension Beam 3.50

COMBINATION CALIPER AND DIVIDER
No. 1160. 10 Inch

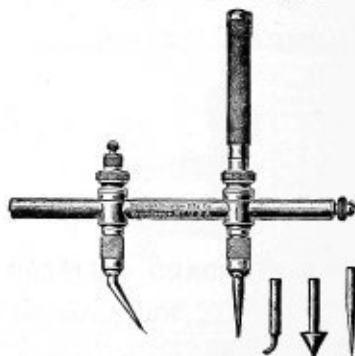
This Combination Caliper and Divider is entirely new in design. The arms or holders are provided with split chucks to receive the auxiliary legs, which are held firmly by the simple turn of the knurled nut that closes the chuck concentrically. A pencil can be substituted for one of the legs if desired.

The tool is of steel carefully finished and sharp corners are practically eliminated.

Prices

Set Complete \$3.00
With Divider Legs only 2.00

UNIVERSAL DIVIDERS



This tool shows many points of excellence in design and construction.

The scriber point holder has both fine and quick adjustment; the fine adjustment is obtained by a screw, enclosed in a beam, which engages the nut on the scriber point holder. By pulling up the small knurled knob, at top of post, the screw is released and the post can be quickly adjusted; this knob springs into place as soon as released.

The scriber point is adjustable either side of the centre, as shown by the dotted lines, and can be set for scribing small circles or for working close to a shoulder. The adjustable centre point is held by a spring chuck and can be removed easily and replaced by pencil or other special points. The posts are clamped by knurled nuts and held in place by spring friction when the nuts are unclamped for setting the points.

A V point is furnished for use in describing a circle about a hole already drilled. A caliper point is also included.

The beam is 4 inches long and the points can be set to describe a circle 8 inches in diameter.

No. 856. Each \$3.00

STARRETT'S TOOLS

STARRETT'S STEEL RULES



English Measure

Rules are divided into parts of inches as follows:—

No. 1 Graduation		No. 10 Graduation	
1st corner.....	10, 20, 50, 100	1st corner.....	.32
2d ".....	12, 24, 48	2d ".....	.64
3d ".....	16, 32, 64		
4th ".....	14, 28		
No. 2 Graduation		No. 11 Graduation	
1st corner.....	10, 20, 50, 100	1st corner.....	.64
2d ".....	12, 24, 48	2d ".....	1.00
3d ".....	16, 32, 64		
4th ".....	8		
No. 4 Graduation		No. 12 Graduation	
1st corner.....	.64	1st corner.....	.50
2d ".....	.32	2d ".....	1.00
3d ".....	.16		
4th ".....	8		
No. 6 Graduation		No. 13 Graduation	
1st corner.....	.32	1st corner.....	.8
2d ".....	.48	2d ".....	.16
3d ".....	.50		
4th ".....	.64		
No. 7 Graduation		No. 14 Graduation	
1st corner.....	.64	1st corner.....	.8
2d ".....	.32	2d ".....	.32
3d ".....	.16		
4th ".....	100		
No. 8 Graduation		No. 15 Graduation	
1st corner.....	.64	1st corner.....	.10
2d ".....	.32	2d ".....	.20
3d ".....	.16	3d ".....	.50
4th ".....	100	4th ".....	1.00
No. 9 Graduation		No. 16 Graduation	
1st corner.....	.64	1st corner.....	.32
2d ".....	.32	2d ".....	.64
3d ".....	.16	3d ".....	.50
4th ".....	100	4th ".....	1.00

LIST PRICES

SPRING TEMPERED RULES

Thickness $\frac{3}{16}$ inch or No. 18 Gauge.

Width, inches.....	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	7	8	9	10	11	12	14	16	18	20	24	30	36	48	60	72	84	96	108	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624	648	672	696	720	744	768	792	816	840	864	888	912	936	960	984	1008	1032	1056	1080	1104	1128	1152	1176	1200	1224	1248	1272	1296	1320	1344	1368	1392	1416	1440	1464	1488	1512	1536	1560	1584	1608	1632	1656	1680	1704	1728	1752	1776	1800	1824	1848	1872	1896	1920	1944	1968	1992	2016	2040	2064	2088	2112	2136	2160	2184	2208	2232	2256	2280	2304	2328	2352	2376	2400	2424	2448	2472	2496	2520	2544	2568	2592	2616	2640	2664	2688	2712	2736	2760	2784	2808	2832	2856	2880	2904	2928	2952	2976	3000	3024	3048	3072	3096	3120	3144	3168	3192	3216	3240	3264	3288	3312	3336	3360	3384	3408	3432	3456	3480	3504	3528	3552	3576	3600	3624	3648	3672	3696	3720	3744	3768	3792	3816	3840	3864	3888	3912	3936	3960	3984	4008	4032	4056	4080	4104	4128	4152	4176	4200	4224	4248	4272	4296	4320	4344	4368	4392	4416	4440	4464	4488	4512	4536	4560	4584	4608	4632	4656	4680	4704	4728	4752	4776	4800	4824	4848	4872	4896	4920	4944	4968	4992	5016	5040	5064	5088	5112	5136	5160	5184	5208	5232	5256	5280	5304	5328	5352	5376	5400	5424	5448	5472	5496	5520	5544	5568	5592	5616	5640	5664	5688	5712	5736	5760	5784	5808	5832	5856	5880	5904	5928	5952	5976	6000	6024	6048	6072	6096	6120	6144	6168	6192	6216	6240	6264	6288	6312	6336	6360	6384	6408	6432	6456	6480	6504	6528	6552	6576	6600	6624	6648	6672	6696	6720	6744	6768	6792	6816	6840	6864	6888	6912	6936	6960	6984	7008	7032	7056	7080	7104	7128	7152	7176	7200	7224	7248	7272	7296	7320	7344	7368	7392	7416	7440	7464	7488	7512	7536	7560	7584	7608	7632	7656	7680	7704	7728	7752	7776	7800	7824	7848	7872	7896	7920	7944	7968	7992	8016	8040	8064	8088	8112	8136	8160	8184	8208	8232	8256	8280	8304	8328	8352	8376	8400	8424	8448	8472	8496	8520	8544	8568	8592	8616	8640	8664	8688	8712	8736	8760	8784	8808	8832	8856	8880	8904	8928	8952	8976	9000	9024	9048	9072	9096	9120	9144	9168	9192	9216	9240	9264	9288	9312	9336	9360	9384	9408	9432	9456	9480	9504	9528	9552	9576	9600	9624	9648	9672	9696	9720	9744	9768	9792	9816	9840	9864	9888	9912	9936	9960	9984	10000																																																																																														
Length, inches.....	1	2	3	4	6	9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

The above list applies on all spring tempered rules.

No.	Graduation	No.	Graduation	No.	Graduation	No.	Graduation	No.	Graduation
300	No. 4	306	No. 6	308	No. 15				
301	No. 1	307	No. 7	309	No. 16				
302	No. 2								

WITH GRADUATED END

2 inch to 24 inch lengths.

No. 303 has No. 4 graduations and is graduated in 32ds of an inch on opposite sides of one end.

No. 304 has No. 4 graduations, and is graduated in 32ds of an inch on one side and in 48ths on the other side of the same end.

WITH ONE BEVELED EDGE

1 inch to 24 inch lengths.

No. 400. Beveled, No. 4 graduation with 64ths on beveled edge.

No. 407. Beveled, No. 7 graduation, with 100ths on beveled edge.

No. 600. These rules are figured so that the 64ths can be quickly and easily read. Has No. 4 graduation.

No. 403. Beveled, No. 4 graduation, with 64ths on the beveled edge, and graduated in 32ds of an inch on opposite sides of one end. 2 inch to 24 inches long.

No. 404. Beveled, No. 4 graduation, with 64ths on the beveled edge, and graduated in 32ds of an inch on one side, and to 48ths on the other side of the same end. 2 inch to 24 inches long.

HEAVY SPRING TEMPERED RULES

Thickness about $\frac{1}{16}$ inch.

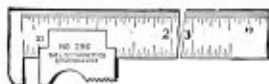
Width, inches.....	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	7	8	9	10	11	12	14	16	18	20	24	30	36	48	60	72	84	96	108	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624	648	672	696	720	744	768	792	816	840	864	888	912	936	960	984	1008	1032	1056	1080	1104	1128	1152	1176	1200	1224	1248	1272	1296	1320	1344	1368	1392	1416	1440	1464	1488	1512	1536	1560	1584	1608	1632	1656	1680	1704	1728	1752	1776	1800	1824	1848	1872	1896	1920	1944	1968	1992	2016	2040	2064	2088	2112	2136	2160	2184	2208	2232	2256	2280	2304	2328	2352	2376	2400	2424	2448	2472	2496	2520	2544	2568	2592	2616	2640	2664	2688	2712	2736	2760	2784	2808	2832	2856	2880	2904	2928	2952	2976	3000	3024	3048	3072	3096	3120	3144	3168	3192	3216	3240	3264	3288	3312	3336	3360	3384	3408	3432	3456	3480	3504	3528	3552	3576	3600	3624	3648	3672	3696	3720	3744	3768	3792	3816	3840	3864	3888	3912	3936	3960	3984	4008	4032	4056	4080	4104	4128	4152	4176	4200	4224	4248	4272	4296	4320	4344	4368	4392	4416	4440	4464	4488	4512	4536	4560	4584	4608	4632	4656	4680	4704	4728	4752	4776	4800	4824	4848	4872	4896	4920	4944	4968	4992	5016	5040	5064	5088	5112	5136	5160	5184	5208	5232	5256	5280	5304	5328	5352	5376	5400	5424	5448	5472	5496	5520	5544	5568	5592	5616	5640	5664	5688	5712	5736	5760	5784	5808	5832	5856	5880	5904	5928	5952	5976	6000	6024 </
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STARRETT'S TOOLS

STARRETT'S SLIDE CALIPER RULES

The graduations are No. 4, with the 32ds and 64ths on the front and the 8ths and 16ths on the back. The thumb piece slides in a groove on the reverse side. The jaws are $\frac{1}{2}$ inch deep.

No. 296. Price each.....\$1.25



No. 296 M. The above rule is furnished with graduations in millimeters and half millimeters at the same price.

STARRETT'S PATENT KEY SEAT RULE

No. 146. One straight edge is a spring-tempered scale, with one edge beveled, graduated in 8ths, 16th 32ds, 64ths, the other a plain straight edge with two or three clamps (according to its length), which are operated by knurled eccentrics clamping corner and edge of straight edge and scale together. This narrow auxiliary straight edge is either plain or graduated in 32ds and 64ths, and sent when ordered. Sent without the auxiliary straight edges unless otherwise ordered.



6-inch, each.....\$2.25
6-inch, with auxiliary straight edge, plain, each.....2.75
6-inch, with auxiliary straight edge, graduated, each.....3.00
9-inch, each.....3.00
9-inch, with auxiliary straight edge, plain, each.....3.75
9-inch, with auxiliary straight edge, graduated, each.....4.25

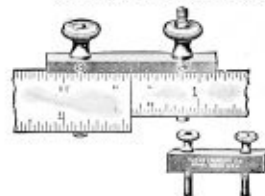
FOLDING STEEL POCKET RULES



No. 450

One foot long, $\frac{3}{4}$ inch wide, 4-inch joints, 3 fold.
Price, each.....\$0.35 Price, per dozen.....\$2.50
In metal bound leather cases.
Price, each.....\$0.35 Price, per dozen.....\$2.50
Two feet long, $\frac{3}{4}$ inch wide, 6-inch joints, 4 fold.
Price, each.....\$0.45 Price, per dozen.....\$4.50
In metal bound leather cases.
Price, each.....\$0.60 Price, per dozen.....\$6.00

STARRETT'S No. 299 RULE CLAMPS



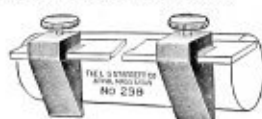
Used for clamping two steel rules together, end to end, making one long rule. The rules to be clamped may be either the same or different widths, up to $1\frac{1}{4}$ inches. This clamp will be of special value to mechanics, whose tool chests will usually not hold rules longer than 12 inches.

Price, each.....\$0.50

STARRETT'S KEY SET CLAMP No. 298

Designed to transform any common steel scale into a Key Seat Rule. They are made from steel, case hardened and ground accurate. A pair weighs but one ounce. They can be put on or off almost instantly.

Price, per pair.....\$0.60



BLACKSMITHS' RULES



No. 460. Folding Steel

Made of best quality spring tempered steel. Two feet long, $\frac{3}{4}$ inch wide, 12-inch joints, 2 fold.

Graduated in 8ths of an inch on one side and 16ths on the other.

Price, each.....\$0.45 Price, per dozen.....\$4.90

No. 462. Folding Brass. With Stop Joint

Made of hard brass. Two feet long, $\frac{3}{4}$ inch wide, 12-inch joints, 2 fold. Graduated in 8ths of an inch on one side and 16ths on the other.

Price, each.....\$0.45 Price, per dozen.....\$4.90

No. 465. HOOK AND HANDLE RULE



Made from hard rolled sheet brass $\frac{1}{16}$ inch thick, $1\frac{1}{2}$ inch wide, with heavy graduations and figures, graduated from the end in 16ths of an inch on one side, and from the inside of the hook in 16ths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. They are graduated 12 inches, have flat handles and measure over all $1\frac{1}{2}$ inches.

Price.....\$1.15

STARRETT'S PATENT COMBINATION SQUARE



No. 11. With Hardened Blade

4-inch, without center head or level.....\$0.75
4-inch, with center head.....\$1.50 without, 1.00
9-inch, with center head.....1.75 without, 1.25
12-inch, with center head.....2.00 without, 1.50
18-inch, with center head.....2.75 without, 2.25
24-inch, with center head.....3.25 without, 2.75

The 6, 9, 12, 18 and 24-inch have levels (in their stocks) and center heads, and will be sent complete unless otherwise ordered. The 18 and 24-inch have same stock as 12-inch.

The blades are graduated in No. 4, No. 1, No. 2 and No. 7 graduations. Those of No. 4 graduation being most used, will be sent unless otherwise ordered.

No. 23 COMBINATION SQUARE

The same in design as No. 11, but, while the blade is made from good, hard steel, it is not hardened. Made with No. 4 graduations only.

4-inch, without center head or level.....\$0.75
4-inch, with center head.....\$1.50 without, 1.00
9-inch, with center head.....1.75 without, 1.25
12-inch, with center head.....2.00 without, 1.50

STARRETT'S TOOLS.

STARRETT PATENT HARDENED STEEL COMBINATION SQUARE



No. 33

The above cut represents the new drop forged steel combination square. Both stock and center head are hardened, as well as the blade, which is graduated with heavy figures reading both ways. Guaranteed to be accurate.

6 inch, with center head.....	\$2.50	without, \$2.00
9 inch, with center head.....	2.75	without, 2.25
12 inch, with center head.....	3.00	without, 2.50
18 inch, with center head.....	3.75	without, 3.25
24 inch, with center head.....	4.25	without, 3.75

STARRETT'S IMPROVED BEVEL PROTRACTORS NO. 12

With Hardened Blade

An adjustable rule, held firmly at any point by a thumb nut, passes through a revolving turret which is nicely graduated in degrees from 0 to 90, both right and left, and can be accurately adjusted to show any angle.

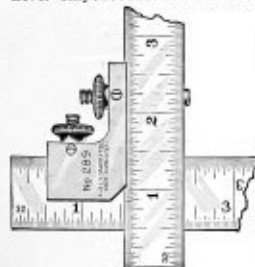


The blades are the same as those used on the No. 11 squares. Those of No. 4 graduation will be sent unless otherwise ordered. The head is 7 inches long.

9 inch, complete.....	\$2.75
12 inch, complete.....	3.00
18 inch, complete.....	3.50
24 inch, complete.....	4.00
Protractor Head with Level attachment.....	2.00
Level only.....	.25

ATTACHMENT FOR COMBINATION SQUARES

Can be used in connection with regular rules up to 1 inch wide, or with Starrett's Nos. 11, 18 and 23 squares or flat steel square No. 21. Price, each75c



STARRETT'S NO. 9 COMBINATION SETS

With Hardened Blade

Cut shows Combination Square No. 11 with center head and 7 inch Bevel Protractor head No. 12, all on the No. 11 square scale. Each head may be instantly removed, or replaced and used interchangeably with the scale.



9 inch, set complete.....	\$3.75
12 inch, set complete.....	4.00
18 inch, set complete.....	4.75
24 inch, set complete.....	5.25

STARRETT'S PATENT INCLINOMETER NO. 10

With Hardened Blade

Cut represents an inclinometer, try square, and bevel protractor combined. The blades are graduated one edge each in 8ths, 16ths, 32ds, and 64ths.



With 12 inch blade.....	\$4.00
With 18 inch blade.....	5.00
With 24 inch blade.....	6.00
Center head, to fit all sizes.....	.75

DOUBLE STEEL SQUARE NO. 14



No. 14

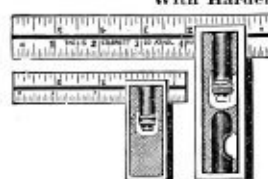
With Hardened Blade

Cut represents a double solid steel square, with our patent 2 1/2 inch sliding scale, and is especially designed for fine tool makers. The scale is graduated on one side only, in 32ds and 64ths.

Square.....	\$2.00
Square with either bevel or narrow blade.....	2.30
Square complete.....	2.60

PATENT DOUBLE SQUARE NO. 13

With Hardened Blade

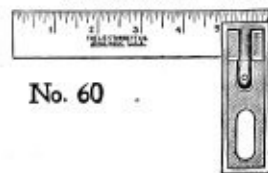


The blades are graduated in No. 4, No. 1, No. 2, and No. 7 graduations. Those of No. 4 graduation will be sent unless otherwise ordered.

Both blades with 4 and 6 inch always sent unless otherwise ordered. There is a level in the stocks of the 6 inch, 9 inch and 12 inch squares.

4 inch.....	\$1.25, with both blades, \$1.65
6 inch.....	2.00, with both blades, 2.50
9 inch.....	3.00
12 inch.....	4.00

"RELIABLE" TRY SQUARE NO. 60



No. 60

Graduated Blade, Not Hardened.

The blade is not riveted or soldered to the stock, but is firmly held by our patent bolt and nut, by means of which the tool can be readily taken apart.

Length of Blade, inches	Length of Beam, inches	Price
4	2 1/4	\$1.00
5	3	1.15
6	3 1/2	1.25
9	5 1/4	2.00
12	6	2.75

STARRETT'S TOOLS

QUICK ADJUSTING MICROMETERS

No. 204



ONE INCH
For Measurements by 1000ths

Can be instantly opened or closed to any point within its capacity without turning screw and without impairing its accuracy or sensitiveness in the slightest degree. Pressure against end of plunger immediately releases the nut when any adjustment can be made and by releasing pressure fine adjustments can be made in the usual way. Has ratchet stop and lock nut.

No. 304.....	\$10.00
In Leatherette case.....	10.50

ONE-INCH MICROMETERS



No.	For Measurements by	Description	Price Each, in Case
1	1000ths	Lock Nut and Ratchet Stop.....	\$6.50
113	1000ths	" " " " " " " "	7.00
202	1000ths	Ratchet Stop only	6.00
208	10000ths	" " " " " " " "	7.00
215	1000ths	No Lock Nut nor Ratchet Stop..	5.50
219	10000ths	" " " " " " " "	6.50
231	1000ths	Lock Nut only	6.00
237	10000ths	" " " " " " " "	7.00

HALF-INCH MICROMETERS

No.	For Measurements by	Description	Price Each
215	1000ths	Lock Nut and Ratchet Stop.....	\$5.50
219	10000ths	" " " " " " " "	6.50
216	1000ths	Ratchet Stop only	5.00
218	10000ths	" " " " " " " "	6.00

Above prices include leather case in which Micrometers are always sent unless otherwise ordered. If case is not wanted deduct 50 cents from list prices named above.

MICROMETER HEADS

English, One-inch

These heads are easily attached to tools or machines when fine measurements are required. Furnished with or without ratchet stops and lock nuts as desired and are graduated to read to thousandths of an inch.



No. 263. Price, each.....\$3.50

SHORT ANVIL MICROMETERS

Nos. 230 AND 231



The anvil is shortened for use in places where the ordinary anvil is too long to be inserted.

Has lock nut and ratchet stop.

No.	For Measurements by	Price Each	Price, in Leather Case
230	1000ths up to 1-inch.....	\$6.00	\$6.50
231	10000ths up to 1-inch.....	7.00	7.50

TWO-INCH MICROMETERS



No.	For Measurements by	Description	Price Each, in case
2	1000ths	Lock nut, Ratchet stop & 1" test gauge	\$7.85
213	10000ths	" " " " " " " "	8.25
217	1000ths	" " " " and 1" test gauge	6.10
214	10000ths	" " " " " " " "	7.25

Above prices include leather case in which Micrometers are always sent unless otherwise ordered. If case is not wanted deduct 50 cents from list prices named above.

PAPER GAUGE MICROMETERS

With Ring

This Micrometer is used in measuring the thickness of paper, sheet rubber, cardboard, etc. Measurements can be taken without compressing the articles measured. Measures all sizes less than $\frac{1}{16}$ of an inch by thousandths of an inch.



No. 223

Description	With Case	Without Case
Without Ratchet stop.....	\$6.75	\$6.25
With Ratchet stop.....	1.25	6.75

No. 212 ATTACHMENT FOR TWO-INCH MICROMETERS

Our 2-inch Micrometer may be instantly converted into a 1-inch tool, by means of this attachment.

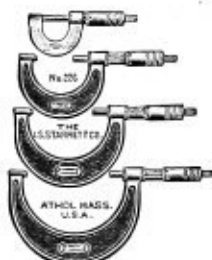


Price, each.....	\$2.00
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STARRETT'S TOOLS

No. 226 NEW MICROMETERS

From One to Six Inches



These micrometers meet the demand for accurate gauges at a low price. They are better adapted for general use than the vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each micrometer is graduated to read by thousandths of an inch, is furnished with patent lock nut, and is sent with or without ratchet stop as desired.

The frames are drop forged from bar steel and are nicely finished.

The 1 inch has the decimal equivalents stamped on the frame. The other sizes are marked to show their capacity.

Standards for use in adjusting these micrometers will be furnished when desired.

Micrometers will be supplied singly or in sets as desired; and will be sent with ratchet stop and without leather case or standard unless otherwise ordered. A reduction is made in the price when sold in sets.

Size

PRICES

1 inch, with decimal equivalents stamped on frame, without ratchet stop.....	\$ 5.50
1 inch, with decimal equivalents stamped on frame, with ratchet stop.....	6.00
2 inch, from 1 inch to 2 inches, without ratchet stop....	4.50
2 inch, from 1 inch to 2 inches, with ratchet stop.....	5.00
1 inch standard.....	1.00
3 inch, from 2 inches to 3 inches, without ratchet stop....	6.00
3 inch, from 2 inches to 3 inches, with ratchet stop....	6.50
2 inch standard.....	1.00
4 inch, from 3 inches to 4 inches, without ratchet stop....	6.50
4 inch, from 3 inches to 4 inches, with ratchet stop....	7.00
3 inch standard.....	1.15
5 inch, from 4 inches to 5 inches, without ratchet stop....	7.25
5 inch, from 4 inches to 5 inches, with ratchet stop....	7.75
4 inch standard.....	1.35
6 inch, from 5 inches to 6 inches, without ratchet stop....	8.00
6 inch, from 5 inches to 6 inches, with ratchet stop....	8.50
5 inch standard.....	1.50

PRICES IN SETS

Number in Set	Includes Sizes	Description	Price without Case	Price with Case
3	1, 2 and 3	Without Ratchet Stop	\$15.50	\$17.50
3	1, 2 and 3	With " " "	17.00	19.00
6	1 to 6	Without " " "	36.00	40.00
6	1 to 6	With " " "	39.00	43.00

PRICES FOR CASES ONLY

For one inch only.....	\$0.50
For set of three Micrometers.....	2.00
For set of six Micrometers.....	4.00

Starrett's No. 128

This micrometer will measure round work to $4\frac{1}{4}$ inches, and flat work to 6 inches. It weighs 21 ounces, and is rigid and accurate. It can be quickly set to exact position, from 1 inch to 6 inches, by inserting a plug as shown.



Price, each.....	\$20.00
In Leatherette case.....	21.50

Sent in case unless otherwise ordered.

No. 124 INSIDE MICROMETER

The cut shows new inside micrometer, No. 124, designed for internal and lineal measurements, such as measuring cylinders, rings; also for setting calipers, comparing gauges, etc. It is also useful in measuring parallel surfaces. The micrometer screw in the head has $\frac{1}{2}$ in. movement in sets A and B, one inch in set C, and, by means of the extension rods furnished, the sizes as given below for each set can be obtained.



Set A has 6 rods and one $\frac{1}{4}$ inch gauge, and measures from 2 inches to 8 inches.

Set B has 10 rods and one $\frac{1}{4}$ inch gauge, and measures from 2 inches to 12 inches.

Set C has 4 rods and one 1 inch and two 2 inch gauges, and measures from 8 inches to 32 inches.

Set D comprises sets A and C, and measures from 2 inches to 32 inches.



Set "C"

Set A, without case..	\$ 4.50	With case.....	\$ 5.25
Set B, without case..	5.50	With case.....	6.50
Set C, without case..	6.50	With case.....	8.00
Set D, without case..	11.00	With case.....	12.50

Handle 50 cents extra.

Sent with case, unless otherwise ordered.

MICROMETER CALIPER GAUGES No. 126

Designed for close internal measurements, indicating thousandths where a definite distance in inches is not essential. The body of the tool is a steel tube provided at one end with a binding chuck in which are fastened the plain rods, and it can quickly be adjusted to any approximate size. The other end has sleeve and body of barrel marked and graduated same as our No. 3 Micrometer Caliper, giving a reading in thousandths, and has $\frac{1}{4}$ inch movement of screw. Anvil in end of sleeve is hardened, as are those in ends of rods.



Capacity $2\frac{1}{2}$ inch to 10 inch (with five rods).....\$2.00

In Leatherette case..... 2.75

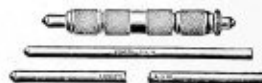
Extra rods at 2 cents per inch.

Sent without case unless otherwise ordered.

ADJUSTABLE CALIPER GAUGE No. 125

Designed for internal measurements of large cylinders and of distances between uprights.

To set the gauge, loosen the chuck that clamps the wire rod, slide the rod out or in to the required size, and clamp it. If not quite correct, loosen the chuck on the opposite end and turn the anvil out or in what little is needed.



$2\frac{1}{2}$ inch with three rods, capacity from $2\frac{1}{2}$ inch to 6 $\frac{1}{4}$ inch.....\$1.00

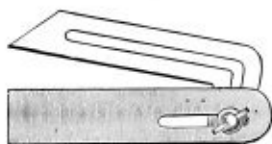
6 inch with three rods, capacity from 6 inch to 16 inch 1.25

The diameter of the steel rods is .150 inch. Extra rods furnished at 2 cents per inch.

STARRETT'S TOOLS

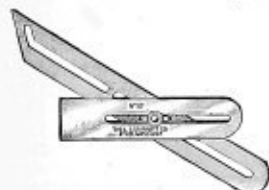
No. 15. UNIVERSAL
BEVEL

Price each,
3 inch.....\$1.50



No. 47

IMPROVED BEVEL

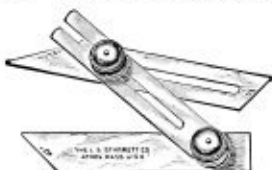


6 in. (length of stock $3\frac{1}{2}$ in.), price each..\$1.25
9 in. (length of stock $4\frac{3}{4}$ in.), price each.. 1.50
12 in. (length of stock 6 in.), price each.. 1.75

No. 49

COMBINATION
BEVEL

Stock about 4 inches
long. Price each \$2.00



STARRETT'S No. 193 PROTRACTOR

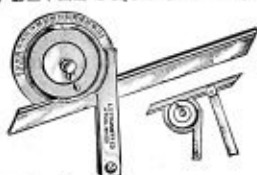


Used for setting bevels No. 15, No. 47 and No. 49 at any desired angle, thus converting them into Bevel Protractors at slight cost.

Price each.....\$1.00

No. 360 UNIVERSAL BEVEL PROTRACTOR

This tool weighs six ounces. Blade is either 7 or 12 by $\frac{1}{2}$ inch, stock 4 ins. long, both made from sheet steel, nicely finished. Disc is graduated in degrees from 0 to 90 each way, and rotates the entire circle on a central stud inside the case.

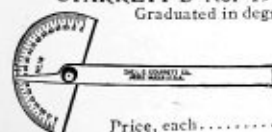


7-inch\$5.00
7-inch in leatherette case..... 5.75
12-inch 6.00
12-inch in leatherette case..... 7.00
With both 7 and 12-inch blades..... 6.50
Same in leatherette case..... 7.50
Attachment, extra..... 1.00

All sent in case unless otherwise ordered.

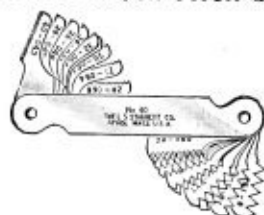
STARRETT'S No. 19 PROTRACTOR

Graduated in degrees from 0 to 90 both ways. The blade is 6 inches long, and by means of patent lock joint is set firmly by a slight turn of the nut. The back of the tool is flat.



Price, each.....

STARRETT'S SCREW PITCH GAUGES



No. 40 IMPROVED

This gauge has twenty-two pitches, viz.: 9, 10, 11, $11\frac{1}{2}$, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, can be used inside a nut as well as on the outside of a screw or bolt.

Price each.....\$1.00

No. 4 SCREW PITCH GAUGE
24 Pitches, 4 to 30

Has the following pitches: 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, 7, 8, 9, 10, 11, $11\frac{1}{2}$, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30. The teeth are sharp and clean cut. Like our No. 40 it can be used inside of a nut as well as on outside of a screw or bolt. It is also a convenient and reliable tool to use as a 60-degree center gauge and gauge to test the grinding of either an inside or outside threading tool.

Price each.....\$1.25

No. 5 SCREW PITCH GAUGE
26 Pitches, 32 to 82

Of the same form as No. 40, for inside and outside work. Has the following pitches: 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82. Price each..\$1.25

No. 6 SCREW PITCH GAUGE
30 Pitches, 4 to 42

Of the same form as No. 4. Has the following pitches: 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, 7, 8, 9, 10, 11, $11\frac{1}{2}$, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42. Price each.....\$1.50

WHITWORTH SCREW PITCH GAUGE
26 Pitches, 4 to 60

For Whitworth standard thread only.

No. 7 has the following pitches: 4, $4\frac{1}{2}$, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40, 48, 60. Price each.....\$1.25

SCREW PITCH GAUGE No. 155
U. S. Standard

No. 155 has 25 pitches, viz.: $2\frac{1}{4}$, $2\frac{3}{8}$, $2\frac{1}{2}$, $2\frac{5}{8}$, $2\frac{3}{4}$, $2\frac{7}{8}$, 3, $3\frac{1}{4}$, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20. Also a center gauge with coarse and fine notch. Price each.....\$1.50

FILLET OR RADIUS GAUGE No. 178

Made in two sizes. A has 26 leaves indicating radii by 64ths from 1-16 inch to $\frac{1}{4}$ inch. Diameters are from $\frac{1}{8}$ inch to $\frac{1}{2}$ inch by 32nds. B has 32 leaves indicating radii by 64ths from 17-64ths to $\frac{1}{2}$ inch. Diameters are from 17-32 inch to 1 inch by 32nds.

Style 178-A.....Each, \$1.00
178-B..... 1.50

STARRETT'S TOOLS

STARRETT'S THICKNESS GAUGE OR
"FEELER" No. 72

This gauge has 22 leaves, varying in thickness by thousandths, running from .004 to .025. The thickness of each leaf is designated by the number upon it. Each leaf may be used singly or in combination with others, and any thickness in thousandths within their limits may be quickly obtained. The leaves fold within the case, which is $2\frac{3}{4}$ inches long.

Price each\$1.50

THICKNESS GAUGE, No. 172



This gauge has eight leaves, viz.: .002, .003, .004, .006, .008, .010, .012, .015. The leaves are tempered, and have the thickness marked upon them. Size of case, $3\frac{3}{4}$ in. long, $\frac{1}{2}$ in. wide; leaves $3\frac{1}{16}$ in. long, $\frac{1}{2}$ in. wide.

No. 172-A. Size $3\frac{3}{4} \times \frac{1}{2}$ inches\$1.00
" 172-B. " $4\frac{1}{2} \times \frac{1}{2}$ " 1.50
" 172-C. " $6\frac{1}{2} \times \frac{1}{2}$ " 2.00
(Size A will be sent unless otherwise ordered.)

STARRETT'S PATENT MICROMETER DEPTH GAUGE, No. 446



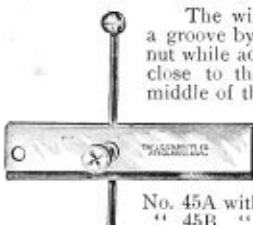
This gauge is designed for measuring the depth of grooves, holes or irregular parts. It has $\frac{1}{2}$ inch movement of the screw, reading in thousandths; and with two $\frac{1}{2}$ -inch and one 1-inch standard collars to slip off or on the spindle, $2\frac{1}{2}$ inches, reading in thousandths, can be obtained. The head is about $\frac{3}{10}$ inch thick and $2\frac{3}{8}$ inches long; this and the point of measuring rod are hardened.

The head carries with it a knurled set screw for locking the spindle to prevent changing after being set.

Without case, each\$4.50
With case, each 5.00

Sent with case unless otherwise ordered.

STARRETT'S No. 45 DEPTH GAUGE



The wire in this gauge is held to a groove by a friction spring inside the nut while adjusting, and may be used close to the end, as well as in the middle of the straight edge.

By loosening the nut, the gauge may be neatly folded.

Price Each
No. 45A with $3\frac{1}{2}$ -in. stock\$0.75
" 45B " 6-in. stock 1.15
" 45C " 10-in. stock 1.35

STARRETT'S No. 46 DEPTH GAUGE



Has in place of the round wire to slide in the groove, as shown with No. 45, a 4-inch or 6-inch scale, $\frac{3}{16}$ -inch wide, graduated in either 32ds and 64ths, 50ths and 100ths, or 64ths and 100ths, indicating exact measurements, and may be used separately from the gauge.

Price Each
46A with $3\frac{1}{2}$ in. stock and 4 in. scale\$1.25
46B " 6 " " " 4 " 1.50
46C " 6 " " " 6 " 1.75
46D " 10 " " " 6 " 2.25

TOOL-MAKERS' PARALLEL CLAMPS, No. 161



Made of steel, case hardened; very useful for holding small work together, in tapping, drilling, etc.

Two complete clamps as illustrated constitute a pair.

The sizes refer to opening of the jaws.

No. 161-AA. Jaw op'ng $\frac{3}{4}$ in., lgth Jaw 1 $\frac{1}{2}$ in. Per pair, \$1.00
" 161-A. " " $1\frac{1}{4}$ " " " 2 " " " 1.25
" 161-B. " " $1\frac{3}{4}$ " " " 2 $\frac{1}{2}$ " " " 1.50
" 161-C. " " 2 $\frac{1}{4}$ " " " 3 " " " 1.00
" 161-D. " " 2 $\frac{3}{4}$ " " " 4 " " " 2.75

TOOL-MAKERS' STEEL CLAMPS,
No. 160

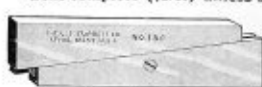
These clamps are made from drop forgings, nicely finished, case hardened, and have take-up blocks to slip on or off end of screw, and are held to same in a novel manner. They will hold work square and parallel for laying out on surface plates, fitting or drilling. A round piece may be rigidly held in two of the clamps and drilled on an upright, central and parallel. Put up and sold in pairs.
1 inch, per pair\$1.00
2 inch, per pair 1.25

STARRETT'S "LITTLE GIANT" JACK SCREWS



No. 190 Jack (a) is $\frac{1}{4}$ in. in diameter at base and has a range from $\frac{1}{8}$ in. to $\frac{3}{8}$ in. will raise 1,000 pounds more. Two extension bases (b & c) fit base of main part (a) and are 2 in. and 1 in. high respectively. Part A, $1\frac{1}{2}$ in. high; B, 1 in.; and C, $\frac{3}{4}$ in. With this size, adjustments from $1\frac{1}{4}$ to $2\frac{1}{4}$ in. are obtainable.

Prices are for either No. 190 or 191.
Jack (A)\$0.75 Extension Base (E)\$0.15
Extension Base (B)20 Extra Screw (D)15
Extension Base (C)15 Jack with all attachments 1.40
Sent complete (\$1.40) unless otherwise ordered.

ADJUSTABLE
PARALLELS

For milling, planing and shapes vises.

Price Each
154A $\frac{3}{4}$ in. Capacity $\frac{1}{2}$ in.\$0.75
154B " " " "30
154C " " " " 1.00
154D " " " " 1.25
154E " " " " 1.50
154F $1\frac{1}{2}$ " " " " 1.75

STARRETT'S TOOLS

STARRETT'S No. 87 MERCURY
PLUMB BOBS

These plumb bobs are made from solid steel bored and filled with mercury. Noteworthy features are their great weight in proportion to size, low center of gravity, small diameter, hardened and ground points, knurling on body, and the simple and effective device at top for fastening end of line after winding up. Each is provided with a braided silk line.

PRICES, NICKEL PLATED.

4 in. long, $\frac{1}{2}$ in. diam., $3\frac{1}{2}$ oz., each	\$1.00
5 in. long, $\frac{3}{8}$ in. diam., 6 oz., each	1.50
5½ in. long, $\frac{7}{8}$ in. diam., 12 oz., each	2.00
6 in. long, 1 in. diam., 16 oz., each	2.50

CENTER TESTER No. 65

This instrument was designed to use in adjusting and locating centrally any point or hole in a piece of work operated upon in a lathe chuck or on a faceplate; also to test the truth of lathe centers or a shaft between the centers, the instrument being held in the tool post.

Price each.....\$2.50



UNIVERSAL TEST INDICATOR No. 64



May be used to test and show imperfections or truth of inside, outside or surface work. Can be instantly attached to spindle or needle of any surface gauge and used in connection with same to show the slightest variation in thousandths. May be clamped to flat or round support, varying in size from a surface gauge needle up to $\frac{3}{8}$ -inch, flat or round.

Indicator only.....\$2.50

Tool Post Holder......50

Indicator, with Tool Post Holder, complete.....2.75

TOOL MAKERS' UNIVERSAL SURFACE
GAUGE No. 56

This gauge is adapted for light work. The base is steel, case hardened, with depressions centrally on sides for the thumb and finger to grasp. A V-shaped groove in the end and bottom adapts it for use on cylindrical work. An auxiliary guide piece is furnished to clamp to the base.

Price, with 4-inch spindle and auxiliary guide.....\$3.00

Price, without auxiliary guide.....2.50

Sent with guide unless otherwise ordered.

A 7-inch spindle is furnished when ordered at an extra cost of 25 cents.



PIN VISES No. 162



Have hardened jaws with chucks for holding scribers, small files, etc., nickel plated.

No. 162A .00 inch to .040 inch	\$0.55
No. 162B .050 inch to .062 inch	.55
No. 162C .060 inch to .125 inch	.55
No. 162D .115 inch to .187 inch	.75
Set complete (one of each size)	2.40

STARRETT'S No. 67 IMPROVED SCRIBER

Length, with short, bent point, 11 inches; with long point, 12 inches. All parts are interchangeable. The knurled sleeve is nickelled.



Complete	\$0.45
Without long point	.35
Straight point, long or short bent point, each	.10

The tool will be sent complete unless otherwise ordered.

IMPROVED ADJUSTABLE SLEEVE
SCRIBER No. 68

Made in two lengths, 8 inches and 12 inches. Tool makers will find the small size more desirable

for general use, and the larger one for heavier work. For pattern makers a knife scriber, made of a fine grade of steel, is supplied as an auxiliary.

Either size, without knife point	\$0.50
Knife point, extra	.15
Extra scriber points, each	.20

The 8-inch, being the more popular size, will be sent (without knife point) unless otherwise ordered.

No. 70 POCKET SCRIBER

This tool is made from steel tubing, knurled and nickel plated. The scriber is reversible, telescoping into the stock, and is held by a slight turn of the chuck so that it is always as safe to carry in the pocket as a penknife.



No. 70A Handle $\frac{1}{2}$ -inch diameter	\$0.25
No. 70B Handle $\frac{3}{8}$ -inch diameter	.35
Points only	.10

No. 29 SCRATCH GAUGE



Made of steel with hardened cast steel head. Beam is graduated in either 50ths or 64ths of an inch. Marker is a thin

square piece of steel, nicely tempered, firmly held against end of beam, presenting four marking points.

5 in. (beam $\frac{1}{2}$ in.) graduated	\$1.00	Not graduated	\$0.65
6 in. (beam $\frac{3}{4}$ in.) graduated	1.25	Not graduated	.75

Unless otherwise ordered, we shall send those graduated in 64ths.

Two extra cutters will be sent with each gauge, fastened to the case.

UNIVERSAL DIAL TEST INDICATOR

Simple, reliable, easily read and very sensitive. Dials are figured in two different ways. Style A is marked from 0 to 62½, denoting thousandths. Style B is marked from 0 to 31½ to right and left and is best for general use. Dial is adjustable and may be instantly moved to bring the 0 mark to any point desired in relation to the hand.



Indicator, A or B, with three contact points, each	\$7.00
Hole or button attachment, F	1.50
Tool post, extra	.50
Surface gauge sleeve, extra	.75
Extra contact points, each	.10

The Indicator with dial B, \$7.00, sent unless otherwise ordered.

STARRETT'S TOOLS

STARRETT'S No. 57 NEW
UNIVERSAL SURFACE
GAUGE

No. 57A 3-inch base with 9-inch spindle.....	\$2.50
No. 57B 3-inch base with 9- and 12-inch spindles.....	2.85
No. 57C 3 3/4-inch base with 12-inch spindles.....	3.00
No. 57D 3 3/4-inch base with 12 and 18-inch spindle.....	3.50
Spindles only, at 3c per inch, list.	

STARRETT'S No. 199 CUT-NIPPER

Wire can be cut at either extreme end of the jaws. All parts are interchangeable, so that in case a jaw breaks a new one can be obtained.

5-inch.....	\$1.50
Jaws, per pair.....	1.00
Jaws, each.....	.50

In ordering extra jaws, specify as per cut which jaw is wanted.

No. 1 ADJUSTABLE JAW CUT-NIPPER



Jaws are detachable so they can be removed, ground and adjusted when worn. Each jaw can be ground away, 1/4 inch remaining as good as new for all practical purposes. When used up new jaws can be obtained. Head and handles are of drop forged steel, finely finished, all parts are casehardened except jaws which are made from a high grade of steel, nicely tempered, have their cutting edges ground to a short, steep bevel, while those for common use have their cutting edges ground more acute, work easier, and are preferable for cutting softer wire or for general use. The 5 1/2-inch nippers open 1/8 inch, and the 7-inch open 5-32 inch.

5 1/2-inch, M (for music wire).....	\$2.00
5 1/2 " C (for common use).....	2.00
5 1/2 " B (for bicycle use).....	2.00
7 " either M, C, or B.....	2.50
Extra jaws either M, C, or B, which should be designated as above, per pair.....	.50
Unless otherwise ordered, Cut-Nippers with M jaws will be sent.	

ELECTRICIANS' POCKET SCREW DRIVER

Handle is covered with hard rubber for insulation from electrical currents and is ribbed to insure a firm grip. Has four blades of different widths, any of which may be quickly taken from handle and inserted in end where it is automatically locked and firmly held. Cap is rigidly held from turning and cannot come off accidentally, with no screws to bind or bother. The widths of the blades are 3-32 in., 5-32 in., 1/4 in. and 3/8 in.

Price, complete,.... \$1.50 Extra Blades, each.. \$0.10

STARRETT'S No. 104 HIGH SPEED INDICATOR



This indicator may run at highest speed required without heating, and this on account of our frictionless bearing, against which the inner end of the spindle revolves. The working parts of this instrument are encased, and the dial plate has two rows of figures, reading right or left, as the shaft may run.

Price.....\$1.00
In leatherette case.....1.50

We supply the indicators with a spindle 7 1/2 inches long for use on Dairy Machines, etc., for 50 cents extra.

The indicator in pasteboard box (list \$1.00) will be sent unless otherwise ordered.

STARRETT'S No. 106 IMPROVED
SPEED INDICATOR

The graduations show every revolution, and with two rows of figures read both right and left, as the shaft may run. The instrument is nickel-plated, and has a rosewood handle.

In pasteboard box.....\$1.50
In leatherette case.....2.00

Sent in pasteboard box unless otherwise ordered.



REGISTERING SPEED INDICATOR, No. 107

This instrument was devised to automatically register hundreds as well as units and tens, and thus relieve the mind from keeping tally. Will register 5,000 revolutions.

In pasteboard box..\$3.00
In leatherette case..3.50

Sent in pasteboard box unless otherwise ordered.

SURFACE SPEED ATTACHMENT FOR SPEED INDICATORS

This attachment is designed to show the number of lineal feet per minute the periphery of a shaft or pulley is running and thus enables a workman to know if the speed is too fast or slow to get the best work. A close approach to accuracy is not claimed, but it will be found very convenient and adequate for the purpose intended. Price, each.....\$0.50



No. 553 POCKET SCREW DRIVERS

This tool is made from steel tubing, knurled and nickel-plated. The butt of the blade fits a solid lock in the tube, preventing it from turning.

To carry in pocket, reverse the blade, inserting it in the handle, giving a slight turn of the chuck to keep secure. It takes no more room in the pocket than a pen-knife.

No. 553A. Handle 1/4 in. diameter, blade 2 3/4 in. long, weight 1/2 oz.... \$0.25

No. 553B. Handle 3/8 in. diameter, blade 3 in. long, weight 1 1/2 oz.... .35

Extra blades each......10



STARRETT'S TOOLS

THE FAY PATENT SPRING DIVIDERS

With Spring Nut

The Fay calipers and dividers, Nos. 74 to 77 all sizes, are sent with Spring Nut unless otherwise ordered.



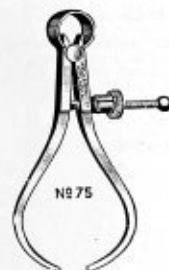
Size, in.	Price Each	
	With Spring Nut.	With Solid Nut.
2½	\$1.15	\$1.00
3	1.15	1.00
4	1.40	1.25
5	1.40	1.25
6	1.75	1.60
8	2.00	1.85

THE FAY PATENT OUTSIDE AND INSIDE CALIPERS

With Spring Nut
Outside, No. 75

Solid Nut. Spring Nut.

2½ inch.....	\$1.00	\$1.15
3 ".....	1.00	1.15
4 ".....	1.10	1.25
5 ".....	1.10	1.25
6 ".....	1.35	1.50
8 ".....	1.60	1.75



Inside, No. 74

Solid Nut. Spring Nut.

2½ inch.....	\$1.00	\$1.15
3 ".....	1.00	1.15
4 ".....	1.10	1.25
5 ".....	1.10	1.25
6 ".....	1.35	1.50
8 ".....	1.60	1.75



THE FAY PATENT THREAD CALIPERS

With Spring Nut

No. 76

Solid Nut. Spring Nut.

3 inch.....	\$1.00	\$1.15
4 ".....	1.10	1.25
5 ".....	1.10	1.25



YANKEE THREAD CALIPER

No. 80

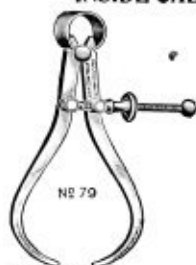
Solid Nut. Spring Nut.

3 inch.....	\$0.70	\$0.85
4 ".....	.75	.90
5 ".....	.80	.95

Always sent with solid nut unless otherwise ordered.



YANKEE OUTSIDE AND INSIDE CALIPERS



Always sent with Solid Nut unless otherwise ordered.



PRICES, FOR No. 79 OR No. 73

	Solid Nut.	Spring Nut.
2½ inch.....	\$0.65	\$0.80
3 ".....	.70	.85
4 ".....	.75	.90
5 ".....	.80	.95
6 ".....	.85	1.00
8 ".....	1.00	1.15
10 ".....	1.35	1.50
12 ".....	1.50	1.65

YANKEE SPRING DIVIDERS

No. 83

Solid Nut. Spring Nut.

2½ inch.....	\$0.65	\$0.80
3 ".....	.70	.85
4 ".....	.75	.90
5 ".....	.80	.95
6 ".....	.85	1.00
8 ".....	1.10	1.25
10 ".....	1.35	1.50
12 ".....	1.50	1.65

Always sent with solid nut unless otherwise ordered.



YANKEE KEYHOLE CALIPERS

No. 82

Solid Nut. Spring Nut.

3 inch.....	\$0.70	\$0.85
4 ".....	.75	.90

Always sent with Solid Nut unless otherwise ordered.



INSIDE THREAD CALIPERS

No. 184

Designed for measuring the diameter at the bottom of threads.

Solid Nut. Spring Nut.

4 inch.....	\$0.75	\$0.90
5 ".....	.80	.95
6 ".....	.85	1.00

Always sent with solid nut unless otherwise ordered.



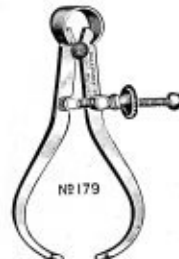
OUTSIDE THREAD CALIPERS

No. 179

Designed for measuring the diameter at bottom of threads on the outside of screws.

	Solid Nut.	Spring Nut.
4 inch.....	\$0.75	\$0.90
5 ".....	.80	.95
6 ".....	.85	1.00

Sent with solid nut unless otherwise ordered.

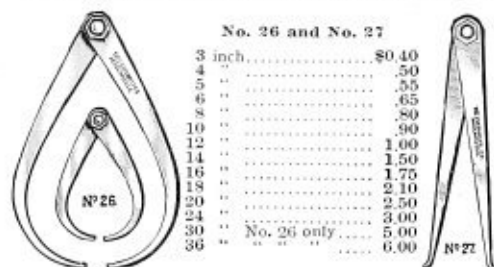


STARRETT'S TOOLS

IMPROVED FIRM-JOINT CALIPERS

The improvement in these calipers consists in the construction of the joint, which is so made as to be drawn together by means of a screw.

Their capacity is about one-third greater than the size given.

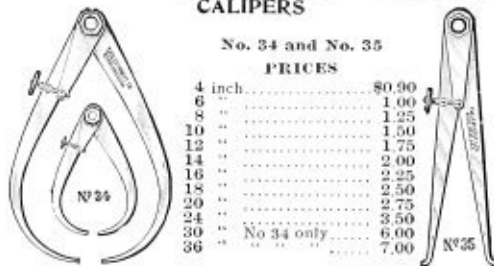


No. 26 and No. 27

3 inch.....	\$0.40
4 ".....	.50
5 ".....	.55
6 ".....	.65
8 ".....	.80
10 ".....	.90
12 ".....	1.00
14 ".....	1.50
16 ".....	1.75
18 ".....	2.10
20 ".....	2.50
24 ".....	3.00
30 ".....	5.00
36 ".....	6.00

No. 26 only

PERFECTED FIRM-JOINT SCREW-ADJUSTING CALIPERS



No. 34 and No. 35

PRICES

4 inch.....	\$0.90
6 ".....	1.00
8 ".....	1.25
10 ".....	1.50
12 ".....	1.75
14 ".....	2.00
16 ".....	2.25
18 ".....	2.50
20 ".....	2.75
24 ".....	3.50
30 ".....	6.00
36 ".....	7.00

No. 34 only

LOCK-JOINT TRANSFER CALIPERS

These instruments not only have all the excellent features of Nos. 38 and 39, but in addition to common use may be used inside of chambered cavities, over flanges, etc., removed and replaced without losing the size calipered.

The sizes given refer to the length of the calipers, but the outside ones will caliper a cylinder 20 per cent. larger than their length, and the inside calipers will open nearly twice their length.



No. 36 and No. 37

4 inch.....	\$1.25
5 ".....	1.40
6 ".....	1.50
8 ".....	1.75
10 ".....	2.00
12 ".....	2.25
14 ".....	2.50
16 ".....	2.75
18 ".....	3.00
20 ".....	3.50
24 ".....	4.25

LOCK-JOINT CALIPERS

Reliable calipers of wide scope for both inside and outside work, that can be instantly adjusted to their full extent, and as quickly locked firm in the joint, and yet provided with a sensitive adjustment.



No. 38 and No. 39

4 inch.....	\$0.90
5 ".....	.95
6 ".....	1.00
8 ".....	1.25
10 ".....	1.50
12 ".....	1.75
14 ".....	2.00
16 ".....	2.25
18 ".....	2.50
20 ".....	2.75
24 ".....	3.50

HERMAPHRODITE CALIPERS

No. 42
With adjustable point, lock-joint and sensitive adjustment.

PRICES

4 inch.....	\$1.00
6 ".....	1.15
8 ".....	1.35
10 ".....	1.60

No. 242

The same as No. 42 except the left hand point is solid instead of adjustable.

PRICES

4 inch.....	\$0.90
6 ".....	1.00
8 ".....	1.25
10 ".....	1.50



No. 42



STARRETT'S No. 44 DOUBLE CALIPERS

These instruments combine dividers, inside and outside calipers. They have improved firm friction joints.

PRICES. No. 44

6 inch.....	\$1.25
8 ".....	1.50

FIRM-JOINT HERMAPHRODITE CALIPERS

PRICES. No. 41

4 inch.....	\$0.65
6 ".....	.80
8 ".....	1.00
10 ".....	1.20

No. 241 is the same as No. 41, except the left hand point is solid instead of adjustable.

PRICES. No. 241

3 inch.....	\$0.40
4 ".....	.50
5 ".....	.55
6 ".....	.65
8 ".....	.80
10 ".....	.90
12 ".....	1.00



No. 41

NEW DIVIDERS

No. 43

With improved lock-joint attachment and sensitive adjustment. It is light and stiff, with large capacity, instantly opened, closed and locked.

PRICES

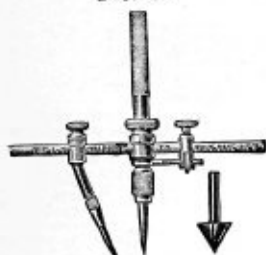
6 inch.....	\$1.00
8 ".....	1.25
10 ".....	1.50



No. 43

STARRETT'S TOOLS

No. 89



STARRETT'S UNIVERSAL DIVIDERS

With the holder turned outward it is possible to work close to shoulders. Turning inward, points may be brought close together to scribe the smallest circle.

With 4-in. beam, $7\frac{1}{2}$ -in. and under may be scribed. An auxiliary beam 13 in. long is furnished, with which a 25-in. circle may be drawn.

PRICES

Tool with 4-in. beam and V center point..... \$1.75

LIST OF EXTRAS

A. Extra Steel Points, each..... \$0.10
B. Needle Points, each..... .35
C. Pen Attachment..... 1.00
D. Extra Straight Point and Socket..... .50
E. Extra 13-in. Beam to scribe 25-in. circle..... .25
F. Coupling..... .35

Total for tool and all attachments..... \$4.00



Tool and V Center Point, listing at 1.75, sent unless otherwise ordered.

STARRETT'S PATENT DIVIDERS
No. 92

An Improved Divider with many Patented Features

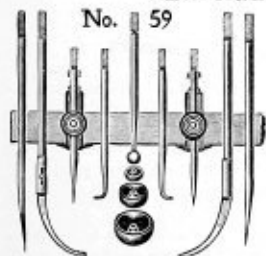
	6-in.	7-in.	8-in.	9-in.
Plain	\$0.85	.90	1.00	1.15
Nickel	1.10	1.15	1.25	1.40

Sent plain, unless otherwise ordered.



NEW TRAMMELS

No. 59



This cut shows the trammels fastened to a wooden beam, which may be any size from $\frac{1}{4}$ inch to 1 $\frac{1}{2}$ inches wide, and of any thickness desired (requiring no fitting), giving stiffness according to the length and adapting it for small or large work.

The auxiliaries designed to go with the trammel heads are as shown, viz., inside and outside caliper legs, an extra pair of long points, a set of four ball points with holder, which enable one to scribe a

circle from the center of any hole up to $1\frac{1}{2}$ inches and under.

PRICES

Trammel Heads (with one pair of points)..... \$2.00
Balls and Holder, per set..... 1.25
Small Caliper Legs, per pair..... .50
Large..... .75
Large Divider Points, "..... .50
Set Complete..... 4.75
Trammel heads with one pair of points will be sent unless otherwise ordered.

IMPROVED BRONZE DIVIDER, No. 90

Nickel Plated



The head, with short point, is eight inches long; may be extended two inches more; will caliper 10 inches outside and 12 $\frac{1}{2}$ inside. With short points it will scribe a 24-inch and with long points a 34-inch circle.

The head and socket legs of this tool are made from drawn (not cast) bronze metal, and are hard, tough, strong, finely finished and nickel plated. With short points only, \$2.25. Set complete..... 4.00

Sent complete, unless otherwise ordered.

EXTENSION BEAM TRAMMELS

Nickel Plated



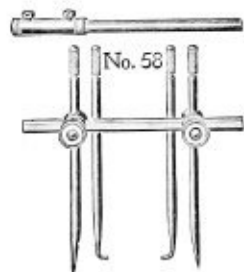
Have opening through the underside to accommodate the extension, giving width and stiffness in proportion to the length required for large work while it is equally well adapted to receive a narrow beam for light work.

Price complete..... \$3.25
Without caliper legs 2.50

Sent complete, unless otherwise ordered.

EXTENSION STEEL BEAM TRAMMELS

The beam of this tool is 5-16 inch round, with one side flattened. It is made in one, two or three sections of 14-inch lengths each, and coupled together by means of an improved socket coupling and grip nut, rigidly holding them for long reaches. With one 14-inch section only, it weighs but 8 ounces. The slides carrying the points grip both beam and points by a partial turn of the knurled out.



PRICES Not Plated Plated

A, with one Section, 14-inch..... \$2.20 \$2.50
B, " two " 28 "..... 2.60 3.00
C, " three " 42 "..... 3.00 3.50
Extra sections..... .40 .50
Caliper Points to fit this tool, extra, per pair..... .50 .60

Those not nickel plated will be sent unless otherwise ordered.

IMPROVED EXTENSION DIVIDER, No. 85



The smallest size is 7 inches long; by adjustment of points it becomes 9 inches, and will scribe a 22-inch circle; will caliper 11 inches outside and 13 inches inside. The second size is 9 inches; by adjustment of points it becomes 12 inches, and will scribe a 30-inch circle, and caliper 14 inches outside and 16 inches inside.

No. 85 A 7-inch, with divider legs only \$1.25
No. 85 B 9 " " " 1.50
No. 85 C 7 " complete..... 2.25
No. 85 D 9 " " " 2.50

No. 85C sent unless otherwise ordered.

For Ball Points which may be used with this tool, see index.

STARRETT'S TOOLS

IMPROVED TRAMMEL
POINTS No. 50Nickel Plated
PRICES

With 3-inch points, adjustable.....\$2.50
 With 3-inch points, not adjustable..... 1.50
 Extra long points, 5-inch, per set..... 35



No. 88 BALL POINTS

For Use with Starrett's No. 85 or No. 90 Dividers and No. 51, No. 58 and No. 59 Trammels

This attachment consists of four balls, of 1/16-inch, 1/8-inch, 1/4-inch, and 1/2-inch diameter respectively, and a holder which fits either divider leg or trammel head. It is used to form a seat for the divider leg in describing circles around a hole.

PRICES

Complete, 4 Balls and Holder.....\$1.25
 Either Ball or Holder..... .25



STARRETT'S CENTER GAUGES

For use in grinding and setting screw cutting tools.



No. 390. Not tempered, graduated one corner each in 32ds, 24ths, 20ths and 16ths.....\$0.25
 No. 391. Spring-tempered..... .35
 No. 395. Whitworth, not tempered..... .25

The angles are 60°, except in No. 395 in which they are 55°.

CENTER GAUGE ATTACHMENT



A V block with a slot above the V, containing a flat spring to frictionally hold the center gauge parallel with the block. Placing the V block against a lathe spindle or face plate, a threading tool can be adjusted to line perfectly to cut both sides of a thread to the proper angle, eliminating uncertainty, for both external and internal work.

The Attachment is adapted to hold the gauges either by the side or by the end for testing work and will be greatly appreciated by all users.

No. 392. Attachment.....\$0.50

STARRETT'S STEEL STRAIGHT EDGES



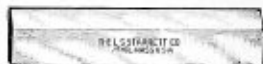
No. 380. Plain

Not graduated. Made in pairs when two are wanted of exactly the same width. The prices given are for single straight edges.

Length Inches	Width, Inches	Thick- ness, Inches	Price Each	Length Inches	Width, Inches	Thick- ness, Inches	Price Each
12	1	3/16	\$1.20	48	2 1/2	1/4	\$3.00
18	1 1/4	1/8	1.80	60	3	3/4	12.00
24	1 1/2	1/8	2.40	72	3	3/4	36.00
36	2	1/8	5.00				

No. 383. Same widths and thicknesses as No. 380 illustrated in above cut, but graduated on one side one edge in 16ths and the other in 8ths of an inch.

12-in.	\$1.80
18 "	2.50
24 "	3.25
36 "	6.25
48 "	10.00



No. 385. Beveled

One edge only is beveled and this to 1/16 inch thick from 1/2 to 3/4 back.

Length Inches	Width, Inches	Thick- ness, Inches	Price Each	Length Inches	Width, Inches	Thick- ness, Inches	Price Each
12	1	3/16	\$1.50	36	2	1/4	\$5.00
18	1 1/4	1/8	2.50	48	2 1/2	3/4	10.00
24	1 1/2	1/8	2.50				

No. 387. Same widths and thicknesses as No. 385 illustrated in above cut, but graduated on beveled edge only in 32ds of an inch.

12-in.	\$2.00
18 "	3.00
24 "	4.25
36 "	7.25
48 "	12.00

STARRETT'S SPACING CENTER PUNCH



Starrett's Combination Prick Punch and Spacing Tool for laying off work quickly and accurately—for drilling, cutting out dies, etc. The prick punch is solid—made from best tool steel, properly tempered.

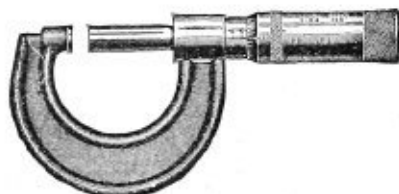
No. 118. Price, each.....\$0.75

STARRETT'S No. 185 TIME SAVER DRILL,
TAP, AND STEEL WIRE GAUGE

By the use of this gauge one is enabled to select at once the right sized drill to suit machine screw tap most commonly used, leaving just stock enough for the tap to cut as near a full thread as is practicable for one tap without breaking it, thus saving much time and uncertainty of result attending the former crude ways of making a selection.

Price, each.....\$1.75

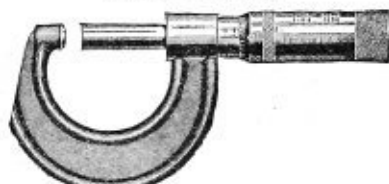
SLOCOMB MICROMETERS



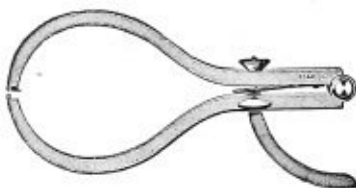
No. 25. One Inch



No. 26. One Inch

No. 31. Any Regular Size
Each Style Takes Same List Prices

No. 101 WING CALIPERS



Size, inches.....	6	8	10	12
Per Dozen.....	\$7.00	\$9.00	\$11.00	\$13.00

No. 35 WING DIVIDERS



Polished

Size, inches...	5	6	7	8	9
Per Dozen....	\$5.50	\$5.50	\$6.50	\$7.50	\$9.00
Size, inches...	10	12	15	18	24
Per Dozen....	\$10.00	\$12.00	\$18.00	\$25.00	\$36.00

STYLES No. 25, 26, 31

Size, inches	Price	Size, inches	Price
$\frac{1}{2}$	\$3.00	7	\$6.75
1	3.50	8	7.00
2	3.50	9	7.25
3	5.00	10	7.50
4	5.50	11	7.75
5	6.00	12	8.00
6	6.50	....	....

For New Friction Stop add to list.....\$0.50

Set No. 19

Six Micrometers, 1 inch to 6 inches. In quartered oak case, with lock and key.

Price, complete.....\$33.25

Price, case only.....3.25

Set No. 20

Twelve Micrometers, 1 inch to 12 inches, on rack. This rack is intended for tool room use. The ends are cast iron, slats are oak with rubber button partings.

Price, complete.....\$96.50

Price, rack only.....5.00

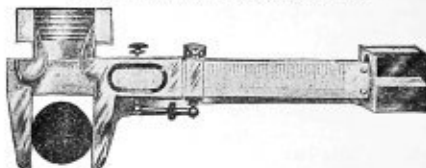
Set No. 21

Three Micrometers, one inch, two inch and three inch, in a good substantial flat case, covered with Morocco Leather and lined with Blue Velvet.

Price complete.....\$12.00

Case only.....1.25

S. S. VERNIER CALIPER



Verniers for reading to 128th of an inch on upper part, to thousandths on lower part. For external, internal and depth measuring. Best workmanship and material. Absolutely accurate. Finished with handsome leather case, if desired.

No. 1. Nickel plated, without Adjusting Screw, each.....\$2.55

No. 2. Nickel plated, with Adjusting Screw, each.....3.15

Leather Pocket, each......20

CASE OF RULES

No. 30

Polished Black Walnut Case, 12 $\frac{1}{2}$ x14x1 $\frac{1}{8}$ inches, containing one each—1, 2, 3, 4, 6, 9, 12 inch Spring Tempered Rule, any graduation— $\frac{1}{4}$ -inch narrow Spring Tempered Rule, any graduation, and one center gauge.

Price complete.....\$4.00

TOOL HOLDERS



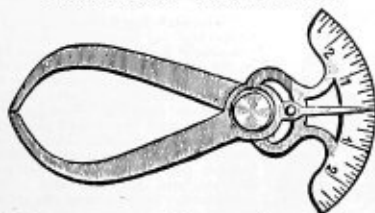
This cut represents the general appearance of the Tool Handles listed below. The handles are made of cocobola, highly polished and of beautiful appearance. The ferrule and jaws are heavily nickel-plated. The jaws will hold not only the tools in hollow handle, but all other things from a fine awl to a mill file. No other tool handle in the market will do this. It also answers the purpose of a hand vise.

No.	No. of Tools	Length of Tools, inches	Length of Handle, inches	Price Each	Price per Dozen
1m	20	13 $\frac{1}{4}$	6	\$1.20	\$12.00
*2R	11	23 $\frac{1}{4}$	8	1.20	12.00
*1R	11	4	7 $\frac{1}{2}$	1.80	18.00

*Has extra saw 8 inches long.

No. 3 REGISTER CALIPERS

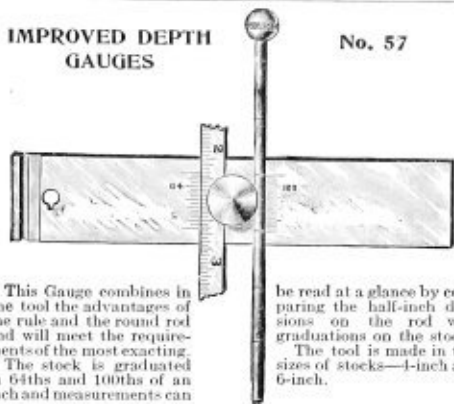
Cast Steel. Nickel Plated. For Inside and Outside Measurement. With Set Screws



Size, inches	3	4	5	6
Per Dozen	\$7.50	\$9.00	\$10.50	\$12.00

IMPROVED DEPTH GAUGES

No. 57



This Gauge combines in one tool the advantages of the rule and the round rod and will meet the requirements of the most exacting. The stock is graduated in 64ths and 100ths of an inch and measurements can

be read at a glance by comparing the half-inch divisions on the rod with graduations on the stock.

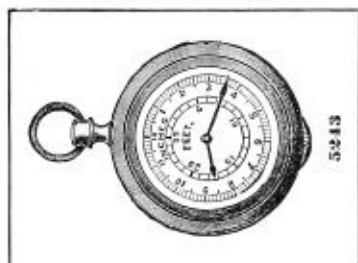
The tool is made in two sizes of stocks—4-inch and 6-inch.

Prices

4-inch stock with rod and	4-inch rule, size A	\$1.25
4 " " " " " " " " " "	B	1.50
6 " " " " " " " " " "	C	1.50
6 " " " " " " " " " "	D	1.75
10-c.m.	E	1.25
10 " " " " " " " " " "	F	1.50
15 " " " " " " " " " "	G	1.50
15 " " " " " " " " " "	H	1.75

THE ROTAMETER

Or Surface Speed Indicator

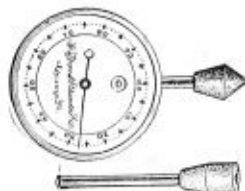


For measuring surfaces by simply running the projecting wheel any distance up to 25 feet. Invaluable in machine or lathe work. Nickel plated.

No. 5243.	1 inch dial in inches and feet	\$2.00
No. 5244.	1 $\frac{1}{2}$ " " " " " " " " " "	4.00
No. 5243M.	1 " " " " " " " " " "	2.00
No. 5244M.	1 $\frac{1}{2}$ " " " " " " " " " "	4.00
No. 5230.	With 3 dials and instantaneous set back, recording to 100 feet	6.00

THE LIGHTNING SPEED INDICATOR

Recording to 1,000 Revolutions



Strictly high grade, for high and low speeds. Rubber tips for flat or hollow centers, also form safe insulation.

Price each	\$2.00
In leatherette case	2.50

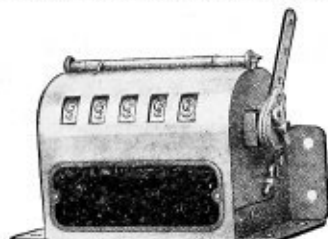
B. & S. SPEED INDICATOR



A small and convenient instrument to handle. Each side has graduated dial permitting speed of shafts running in opposite directions being taken on separate dials, avoiding confusion and error. Quickly readjusted after reading is obtained by means of knurled readjusting wheel.

Price each \$4.00

THE REDINGTON COUNTING MACHINE

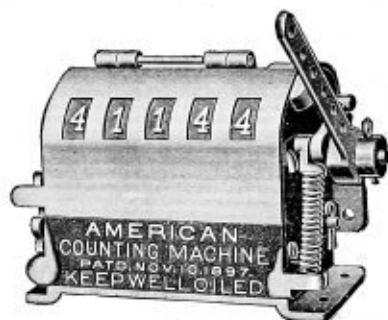


Size, $3\frac{1}{4} \times 2\frac{1}{4} \times 2\frac{1}{4}$ inches.

For accurate and rapid counting. All parts made of sheet steel and interchangeable. Working parts enclosed, yet easily accessible. Can be set back to zero without key or other device. Will not jump or lose count when run at high speed.

Price each \$5.00

AMERICAN COUNTING MACHINE

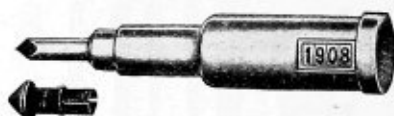


Size, $6 \times 3\frac{1}{2} \times 3$ inches.

Any wheel can be set without disturbing the others. Operating lever can be operated from four different positions. Strictly well made and first class throughout.

Price each \$6.00

VEEDER SPEED COUNTER



A small, compact instrument; positive count and very easily read. Reading is always in sight and cannot be accidentally disturbed. Operator does not have to watch counter, but can give all his attention to watch.

Price each \$3.00

THE IDEAL REVOLUTION COUNTER



Can be set back to zero by a single pressure on the crown. Not set in motion until button is released, thus insuring great accuracy of count. Will work right or left. Size, $1\frac{1}{2}$ inches diameter, $\frac{1}{2}$ inch thick; convenient for vest pocket.

No. 9425. With 3 dials, recording 10,000 revolutions.

Price each \$4.50

No. 9426. With 4 dials, recording 100,000 revolutions.

Price each 6.00

THE JOB COUNTER



Parts are stamped from steel and brass, with case hardened Ratchet and Dog, and best of material used in its construction.

No. 1. Counts 10,000 price each, \$3.00

No. 2. " 100,000 " 3.25

THE BENTON TALLY REGISTER



These little Registers are positive in their action and can be set to zero at will. They are simple in construction, can be carried in the pocket, are about the size of an ordinary watch, and weigh about 6 ounces. They are used by railroad, telegraph and steamboat men for checking or tallying ties, telegraph poles, and passengers, and all kinds of freight, by cattlemen for counting cattle and sheep, by lumbermen, loggers, and timber estimators, and by detectives and spotters, and at places of amusement for counting the people going in and out. In fact they can be used for

any purpose where a correct count is desired to be kept.

No. 00. Records to 100 price each, \$2.00

No. 0. " 1,000 " 2.50

No. 1. " 10,000 " 3.50

THE CHAMPION EXPANDING LATHE MANDRELS



No.	Range	Length of Arbor, inches	Length of Sleeve, inches	Price
1	$\frac{1}{2}$ in. up to $\frac{3}{4}$ in.	5 $\frac{1}{2}$	2 $\frac{1}{2}$	\$ 5.00
2	$\frac{3}{4}$ in. up to 1 in.	6 $\frac{1}{2}$	2 $\frac{1}{2}$	5.50
3	$\frac{1}{2}$ in. up to 1 $\frac{1}{4}$ in.	6 $\frac{1}{2}$	2 $\frac{1}{2}$	6.00
4	$\frac{3}{4}$ in. up to 1 $\frac{3}{4}$ in.	7 $\frac{1}{2}$	3 $\frac{1}{4}$	6.50
5	$\frac{1}{2}$ in. up to 1 in.	7 $\frac{1}{2}$	3 $\frac{1}{4}$	7.50
6	1 in. up to 1 $\frac{1}{2}$ in.	9 $\frac{1}{4}$	4	13.50
7	1 $\frac{1}{2}$ in. up to 1 $\frac{3}{4}$ in.	9 $\frac{1}{4}$	4	15.50
8	1 $\frac{3}{4}$ in. up to 2 in.	11 $\frac{1}{2}$	5 $\frac{1}{2}$	17.50
9	2 in. up to 2 $\frac{1}{4}$ in.	14 $\frac{1}{2}$	5 $\frac{1}{2}$	26.50
10	2 $\frac{1}{4}$ in. up to 3 $\frac{1}{4}$ in.	17	6	37.50
11	3 $\frac{1}{4}$ in. up to 5 in.	20	7	52.00
12	5 in. up to 6 $\frac{1}{2}$ in.	24	8	68.50

NOTE.—All sizes, from No. 1 to No. 5 inclusive, have one flexible sleeve only. Price of sleeves two-thirds of price shown above.

All sizes from No. 6 upwards have two flexible sleeves to obtain maximum expansion. Price of sleeves, each, one-half of price shown above.

Packed in neat individual boxes.

Special Price for Complete Set, \$250.00.

HARDENED AND GROUND STEEL MANDRELS



The Mandrels are made of good quality Tool Steel, and are hardened and ground true to centers. The centers are not injured by driving. The Mandrels are slightly tapered, and the size of the Mandrel is stamped at its larger end.

Diam., inches	Price Each	Length, inches	Diam., inches	Price Each	Length, inches
$\frac{1}{4}$	\$0.65	3 $\frac{3}{4}$	2 $\frac{1}{4}$	\$6.00	12
$\frac{3}{8}$	.75	4	2 $\frac{1}{2}$	6.50	12
$\frac{1}{2}$	.85	4 $\frac{1}{2}$	2 $\frac{3}{4}$	6.90	12
$\frac{5}{8}$	.95	4 $\frac{3}{4}$	3	7.40	12
$\frac{3}{4}$	1.05	5	3 $\frac{1}{4}$	7.90	12 $\frac{1}{2}$
$\frac{7}{8}$	1.15	5 $\frac{1}{4}$	3 $\frac{1}{2}$	8.40	12 $\frac{1}{2}$
$\frac{15}{16}$	1.25	5 $\frac{1}{2}$	3 $\frac{3}{4}$	8.90	12 $\frac{1}{2}$
$\frac{1}{2}$	1.35	5 $\frac{3}{4}$	4	9.40	12 $\frac{1}{2}$
$\frac{3}{4}$	1.45	6	4 $\frac{1}{4}$	9.90	13
$\frac{15}{16}$	1.55	6 $\frac{1}{4}$	4 $\frac{1}{2}$	10.50	13
$\frac{1}{2}$	1.70	6 $\frac{1}{2}$	4 $\frac{3}{4}$	11.00	13
$\frac{3}{4}$	1.85	6 $\frac{3}{4}$	5	11.50	13
$\frac{15}{16}$	2.00	7	5 $\frac{1}{4}$	12.00	13
1	2.10	7 $\frac{1}{4}$	5 $\frac{1}{2}$	12.50	13
1 $\frac{1}{4}$	2.20	7 $\frac{1}{2}$	5 $\frac{3}{4}$	13.00	14
1 $\frac{1}{2}$	2.30	7 $\frac{3}{4}$	6	13.40	14
1 $\frac{3}{4}$	2.45	8	6 $\frac{1}{4}$	13.80	14
1 $\frac{5}{8}$	2.60	8 $\frac{1}{4}$	6 $\frac{1}{2}$	14.10	14
1 $\frac{3}{4}$	2.75	8 $\frac{1}{2}$	6 $\frac{3}{4}$	14.40	15
1 $\frac{5}{8}$	2.90	8 $\frac{3}{4}$	7	14.70	15
1 $\frac{3}{4}$	3.10	9	7 $\frac{1}{4}$	15.00	15
1 $\frac{5}{8}$	3.30	9 $\frac{1}{4}$	7 $\frac{1}{2}$	15.30	15
1 $\frac{3}{4}$	3.50	9 $\frac{1}{2}$	7 $\frac{3}{4}$	15.60	16
1 $\frac{5}{8}$	3.70	9 $\frac{3}{4}$	8	15.90	16
1 $\frac{3}{4}$	3.90	10	8 $\frac{1}{4}$	16.20	16
1 $\frac{5}{8}$	4.10	10 $\frac{1}{4}$	8 $\frac{1}{2}$	16.50	16
1 $\frac{3}{4}$	4.35	10 $\frac{1}{2}$	8 $\frac{3}{4}$	16.80	17
1 $\frac{5}{8}$	4.60	10 $\frac{3}{4}$	9	17.20	17
2	4.80	11	9 $\frac{1}{4}$	17.60	17
2 $\frac{1}{4}$	5.15	11 $\frac{1}{4}$	9 $\frac{1}{2}$	18.00	17
2 $\frac{1}{2}$	5.60	11 $\frac{1}{2}$			

TWEEZERS

Length, 4 inches



Price each, polished,.....\$0.15 Per Dozen.....\$1.10



Price each, nickel plated, \$0.25 Per Dozen.....\$2.00

HORSESHOE MAGNETS



PRICES

Size, inches	2	3	4	5	6
Per dozen	\$0.60	\$1.10	\$2.00	\$4.00	\$7.50
Each	.06	.10	.20	.40	.75

NEW JUMBO NAIL PULLER



Shank and claw forged from high-grade tool steel. Has hand guard and will not turn in handle. Tested and fully warranted. Size, 18 inches.....each, \$1.80; per dozen, \$18.00

BOX HOOKS



Round Shank,
Light Pattern



Octagon Shank,
Heavy Pattern

ROUND SHANK

No.	Diameter, inches	Length under Handle, inches	Price, per Dozen
4	$\frac{5}{16}$	3 $\frac{1}{2}$	\$2.25
6	$\frac{3}{8}$	5	2.50

OCTAGON SHANK

Length Over All, inch	Diameter, inches	Price, per Dozen
8	$\frac{1}{8}$	\$ 5.00
10	$\frac{1}{4}$	6.00
12	$\frac{3}{8}$	7.00
15	$\frac{1}{2}$	11.00

OIL FINISHED COLD CHISELS

Furnished in American Tool or Jessop's
English Steel

Hand



Cape



Diamond Point



Round Nose

HAND

Size	Cutting Edge	Length, inches	Price Each	Price, per Dozen
1/4	3/8	4 1/2	\$0.15	\$1.50
3/8	1/2	5	.15	1.50
1/2	3/4	5 1/2	.25	2.25
5/8	3/4	6	.40	4.00
3/4	7/8	6 1/2	.70	7.00
7/8	1	7	1.10	11.00
1	1 1/8	7 1/2	1.50	15.00
		8	2.00	20.00

CAPE

Size	Cutting Edge	Length, inches	Price Each	Price, per Dozen
1/4	3/8	4 1/2	\$0.20	\$2.00
3/8	1/2	5	.30	3.00
1/2	3/4	5 1/2	.35	3.25
5/8	3/4	6	.50	5.00
3/4	7/8	6 1/2	.60	6.00
		7	.70	7.00

DIAMOND POINT

Size	Cutting Edge	Length, inches	Price Each	Price, per Dozen
1/4	3/8	4 1/2	\$0.65	\$6.50
3/8	1/2	5	.65	6.50
1/2	3/4	5 1/2	1.00	10.00
5/8	3/4	6	1.00	10.00

ROUND NOSE

Size	Cutting Edge	Length, inches	Price Each	Price, per Dozen
1/4	3/8	4 1/2	\$0.60	\$6.00
3/8	1/2	5	.65	6.50
1/2	3/4	5 1/2	.70	7.00
5/8	3/4	6	1.00	10.00
3/4	7/8	6 1/2	1.20	12.00
		7	1.40	14.00

When not otherwise specified, we send Chisels made of American cast steel.

LONG BRICK CHISELS
For Digging Through Brick Walls

Size of Octagon Steel, 5/8, length	inches, 16
11	18
11	21
11	24
11	27
11	30
Price	per pound, \$0.30

KNURLED CUP POINT NAIL SET



No. 999

Size, inches	Price Each	Price, per Dozen
3/8	\$0.20	\$2.00
1/2	.20	2.00
5/8	.20	2.00
3/4	.20	2.00

Assorted, per dozen, \$2.00

KNURLED CENTER PUNCHES



No. 995

These punches are the companion tools to our 999 Nail Sets, above described, and are tempered their entire length. The diameter of steel at knurling is 5/8 inch.

Price, per dozen, \$2.50

SOLID DRIVE PUNCHES

Nos. 00 0 1 2 3 4 5 6
Size, inch. 1/8 3/8 1/2 5/8 3/4 7/8 1
Made of 1/2 inch Octagon Cast Steel.
Length, 6 inches, average weight per doz., 3 1/4 lbs., per lb. \$0.30

MACHINISTS' BELL CENTERING PUNCH



Full Polished

No. 50. Centers from 3/8 inch to 1 1/2 inch. Per dozen, \$8.00

CURVED BEARING SCRAPERS

Guaranteed Hard and Perfect



Have just the right curve on blade for scraping metal bearings and grooves on automobiles. Forged from the finest grade of steel properly tempered for effective work.

Price set of three, \$3.00

REAMER BITS

Best Tool Steel, Full Polished



Square



Octagon



Half Round

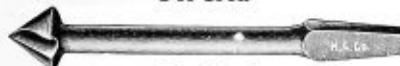
No.	Kind	Price Each	Price Dozen
8	Square	\$0.15	\$1.50
9	Half Round	.20	1.80
10	Octagon	.20	2.00

COUNTERSINK BITS

Cast Steel. Blued and Polished



For Iron



For Wood

No.	Kind	Price Each	Price Dozen
3	Flat for Iron	\$0.15	\$1.25
5	Small for Wood	.15	1.25

SCREW DRIVER BITS

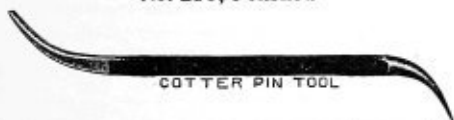
Forged Steel



Size, inches	1/2	5/8	3/4	1/2
Per Dozen	\$1.00	\$2.15	\$2.25	\$2.40

COTTER PIN EXTRACTORS

No. 236, Polished



7 inches long, 3/8 square tool steel. Each.....\$0.36

BRASS AND IRON PLUMB BOBS

Iron, Japanned



Nos. 1 1/2 and 5 Iron

No.	Weight	Each	Dozen
1	9 1/2 oz.	\$0.10	\$0.84
1 1/2	18 "	.15	1.60
1 1/2	1 1/2 lbs.	.20	2.00
5	2 1/4 "	.25	2.25

Brass

Screw Caps. Steel Points

No.	Weight, ounces	Price Each	No.	Weight, pounds	Price Each
1	9	\$0.85	4	2	\$1.50
2	12	1.00	5	4	2.00
3	16	1.25			



BRASS

STEEL SQUARES

Extra Quality and Finish



No.	Body, inches	Tongue, inches	Face	Each	Dozen
1	24 x 2	16 x 1 1/2	3/8-1/8	\$1.80	\$18.00
3	24 x 2	16 x 1 1/2	1/8-1/4	1.50	15.00
14	24 x 2	16 x 1 1/2	1/8-1/4	1.30	12.75
12	12 x 1 1/2	18 x 1	1/8-1/8	1.15	11.25

The following finishes are carried in stock:

No. 1—Polished satin finish.

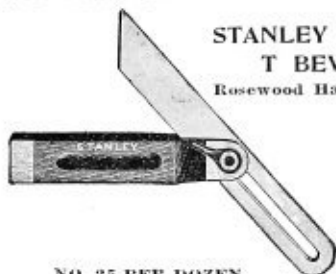
No. 5—Oxidized copper, black, with white markings.

No. 14—Polished, satin finish.

No. 12—Polished, satin finish.

STANLEY SLIDING T BEVELS

Rosewood Handles With Brass Lever (Flush)



NO. 25 PER DOZEN

Size, inches	Price	Size, inches	Price
6	\$3.95	12	\$5.00
8	4.30	14	5.40
10	4.65		

STANLEY NO. 20 TRY SQUARE

Rosewood Handle



PER DOZEN

Size, inches	Price	Size, inches	Price
3	\$2.25	9	\$5.10
4 1/2	2.70	10	5.50
6	3.60	12	6.70
7 1/2	4.15		

"BAILEY" IRON SPOKE SHAVES

No. 51. Double iron-raised handle 10 inches, 2 1/2 inch cutter.
Price per dozen.....\$3.50

"BAILEY" ADJUSTABLE PLANES**WOOD PLANES**

No.	Style	Length, ins.	Cutter, ins.	Price Each
24	Smooth	8	2	\$1.50
27	Jack	15	2 1/4	1.90
29	Jointer	26	2 3/8	2.40

**BLOCK PLANES**

No.	Style	Length, ins.	Cutter, ins.	Price Each
9 1/2	Adjust'ble Block	6	1 3/4	\$1.10
18	Knuckle Joint	6	1 3/4	1.30
102	Plain Block	5 1/2	1 1/4	.40
120	Adjusted Block	7 1/2	1 3/4	.75

**IRON PLANES**

No.	Style	Length, ins.	Cutter, ins.	Price Each
3	Smooth	8	1 3/4	\$2.20
5	Jack	14	2	2.75
6	Fore	18	2 1/4	3.50
8	Jointer	24	2 3/8	4.80

**CORRUGATED BOTTOMS**

No.	Style	Length, ins.	Cutter, ins.	Price Each
3 C	Smooth	8	1 3/4	\$2.20
5 C	Jack	14	2	2.75
6 C	Fore	18	2 1/4	3.50
7 C	Jointer	22	2 3/8	4.00

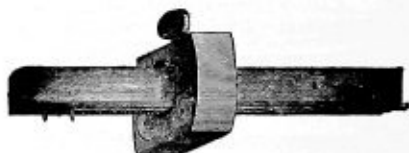
STANLEY MARKING GAUGES

No. 62. Polished, beechwood, marked, boxwood thumb screw, oval bar, adjusting steel point.

Price per dozen.....\$2.00

No. 65. Polished, boxwood, plated head, brass thumb screw and shoe, oval bar, marked, adjusting steel point.

Price per dozen.....\$6.00

MARKING AND MORTISE GAUGE COMBINED

No. 72. Polished, beechwood, boxwood thumb screws, oval bars, marked, steel points.

Price per dozen.....\$4.00

STANLEY PLUMBS AND LEVELS

No. 3. Adjustable Plumb and Level, arch top plate, two side views, polished and tipped. Assorted, 24 inches to 30 inches.

Price per dozen.....\$16.50

No. 4. Same as No. 3, except with two brass lipped side views.

Price per dozen.....\$19.20

No. 5. Same as No. 4, except with triple stock.

Price per dozen.....\$22.50



No. 25. Adjustable Plumb and Level, mahogany, arch top plate, improved duplex side views, polished, tipped. Assorted, 24 to 30 inches.

Price per dozen.....\$26.00

No. 30. Same as No. 25, except made of cherry.

Price per dozen.....\$20.00



No. 7. Mason's Plumb and Level, arch top, plate, two plumbs, two side views, polished and tipped, 36 inches.

Price per dozen.....\$21.00

No. 7 1/2. Same as No. 7, but not tipped.

Price per dozen.....\$18.90

SOCKET FIRMER CHISELS

Leather Tipped Handles

**Straight Edge****Bevel Edge**

Blades 6 to 7 inches long.

Extra Quality Steel, Full Polished, Hickory Handle.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{8}$	\$1.25	\$12.50	$\frac{7}{8}$	\$1.55	\$15.50
$\frac{1}{4}$	1.25	12.50	1	1.65	16.50
$\frac{3}{8}$	1.25	12.50	$1\frac{1}{4}$	1.80	18.00
$\frac{1}{2}$	1.35	13.50	$1\frac{1}{2}$	1.90	19.00
$\frac{5}{8}$	1.45	14.50	$1\frac{3}{4}$	2.00	20.00
$\frac{3}{4}$	1.45	14.50	2	2.10	21.00

For Bevel Edge add 75c per Dozen NET EXTRA

Assorted in Sets. Plain Boxes

PRICE PER SET

6 Chisels, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, 1, $1\frac{1}{4}$, 2	\$ 8.00
8 " $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	10.50
9 " $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	11.00
12 " $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	16.00

Sets in Fancy Boxes

With attachment for holding tools in place.

6 Chisels, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, 1, $1\frac{1}{4}$, 2	Per Set \$11.00
12 " $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	24.00

SOCKET FRAMING CHISELS

With Malleable Ferrule Tip

**Straight Edge**

Blades 8 inches long.

Extra Quality Steel, Full Polished, Hickory Handle.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{8}$	\$1.50	\$15.00	1	\$1.80	\$18.00
$\frac{1}{4}$	1.50	15.00	$1\frac{1}{4}$	2.00	20.00
$\frac{3}{8}$	1.60	16.00	$1\frac{1}{2}$	2.20	22.00
$\frac{1}{2}$	1.70	17.00	$1\frac{3}{4}$	2.40	24.00
$\frac{5}{8}$	1.70	17.00	2	2.60	26.00
$\frac{3}{4}$	1.80	18.00			

TANGED TURNING CHISELS

Length of Blades, 7 inches.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{8}$	\$0.20	\$3.00	$\frac{7}{8}$	\$0.50	\$ 5.00
$\frac{1}{4}$	.30	3.00	1	.60	5.75
$\frac{3}{8}$	.35	3.25	$1\frac{1}{4}$	.75	7.25
$\frac{1}{2}$	.40	3.60	$1\frac{1}{2}$	.95	9.25
$\frac{5}{8}$	.40	4.00	$1\frac{3}{4}$	1.15	11.25
$\frac{3}{4}$	.45	4.50	2	1.35	13.25

TANGED TURNING GOUGES

Length of Blade, 7 inches.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{8}$	\$0.40	\$3.75	$\frac{7}{8}$	\$0.70	\$ 7.00
$\frac{1}{4}$	.40	3.75	1	.80	8.00
$\frac{3}{8}$	.45	4.25	$1\frac{1}{4}$	1.00	10.00
$\frac{1}{2}$	.50	4.75	$1\frac{1}{2}$	1.20	12.00
$\frac{5}{8}$	.55	5.25	$1\frac{3}{4}$	1.50	15.00
$\frac{3}{4}$	.60	6.00	2	1.80	18.00

SOCKET FIRMER GOUGES

Blades 6 inches long.

Extra Quality Steel, Full Polished, Hickory Handle.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{8}$	\$0.70	\$7.00	$\frac{7}{8}$	\$1.55	\$15.50
$\frac{1}{4}$	.70	7.00	1	1.60	16.00
$\frac{3}{8}$	.75	7.50	$1\frac{1}{4}$	1.70	17.00
$\frac{1}{2}$	.80	8.00	$1\frac{1}{2}$	1.80	18.00
$\frac{5}{8}$	.85	8.50	$1\frac{3}{4}$	1.90	19.00
$\frac{3}{4}$	.90	9.00	2	2.00	20.00

CARPENTERS' SLICKS

Blades 11 inches long.

Extra Quality Steel, Full Polished, Hickory Handle.

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
$\frac{1}{4}$	\$4.00	\$40.00	$3\frac{1}{2}$	\$5.25	\$52.50
$\frac{1}{2}$	4.50	45.00	$3\frac{3}{4}$	5.50	55.00
$\frac{3}{4}$	4.75	47.50	4	6.50	65.00
2	5.00	50.00			

DRAW KNIVES

Made from the Best Quality Steel, Hickory Handles, Polished Caps and Ferrules.

Carpenters' Razor Blade

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
6	\$2.20	\$22.00	11	\$2.70	\$27.00
7	2.20	22.00	12	2.70	27.00
8	2.20	22.00	13	2.90	29.00
9	2.40	24.00	14	2.90	29.00
10	2.50	25.00	16	3.20	32.00

With Folding Handles

Size, inches	8	9	10
Price Each	\$ 3.85	\$ 4.00	\$ 4.25
Price per Dozen	37.50	40.00	42.50

PERFECT HANDLE DRAW KNIFE

This tool is drop forged from solid piece of crucible steel. The "perfect handle" will never pull off. Every tool warranted.

Size, inches	8	10	12
Price Each	\$ 2.00	\$ 2.20	\$ 2.40
Price per Dozen	20.00	22.00	24.00

BIT BRACE AUGER BITS

**Snell Pattern**

Crucible tool steel, double spur, full polished, fully warranted.

**Jennings Pattern**

Solid crucible tool steel, full polished extension lip.

**Irwin Pattern**

Solid crucible tool steel, accurate and finely finished.

Size In Sixteenths	Price Each	Price, Dozen	Size in Sixteenths	Price Each	Price, Dozen
3	\$0.45	\$4.50	16	\$0.90	\$ 9.00
4	.40	4.00	17	1.05	10.50
5	.40	4.00	18	1.05	10.50
6	.40	4.00	19	1.20	12.00
7	.45	4.50	20	1.20	12.00
8	.50	5.00	21	1.35	13.50
9	.55	5.50	22	1.35	13.50
10	.60	6.00	23	1.50	15.00
11	.70	7.00	24	1.50	15.00
12	.70	7.00	26	1.70	17.00
13	.80	8.00	28	1.90	19.00
14	.80	8.00	30	2.10	21.00
15	.90	9.00	32	2.30	23.00

AUGER BITS IN SETS

**Irwin Pattern**

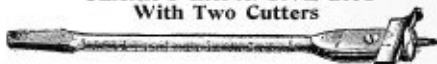
No.	Contains Bits	Price
D	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	\$7.00

In neat wooden case with lid and sliding drawer. No cases sent without bits.

Jennings Pattern

No.	Contains Bits	Price
156	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	\$7.00

In improved bit box, provided with strong durable springs, which hold the bits firmly in place.

CLARK'S EXPANSIVE BITS
With Two Cutters

Size	Cuts, inches	Price Each	Price Dozen
Small.....	1/2 to 1 1/2	\$1.80	\$18.00
Large.....	3/4 to 3	2.60	26.00

Extra Cutters

No.	Cuts, inches	Price Each	Price Dozen
1	1/2 to 3/4	\$0.30	\$ 3.00
2	3/8 to 1 1/2	.35	3.75
3	3/8 to 1 3/4	.50	5.25
4	1 1/2 to 3	.60	6.00
5	2 1/2 to 4	.90	9.00
6	3 1/2 to 5	1.20	12.00

NUT AUGERS

Size	Each	Dozen	Size	Each	Dozen
3/8	\$0.70	\$ 7.00	1 3/4	\$ 2.60	\$26.00
1/2	.80	8.25	2	3.00	30.00
5/8	.95	9.50	2 1/4	4.00	40.00
3/4	1.05	10.75	2 1/2	5.00	50.00
7/8	1.20	12.00	2 3/4	7.00	70.00
1	1.30	13.25	3	9.00	90.00
1 1/8	1.50	15.00	3 1/4	12.00	120.00
1 1/4	1.70	17.00	3 1/2	15.00	150.00
1 3/8	1.90	19.00	3 3/4	18.00	180.00
1 1/2	2.20	22.00	4	21.00	210.00

SHIP AUGERS



SHIP AUGER CAR BITS



SHIP AUGER BITS



Ship Augers—Crucible Tool Steel, with or without starting screw; standard twist and square shank. For heavy work in rough timber or hardwood.

Ship Auger Car Bits—With or without starting screws. Crucible Tool Steel, with standard twist (8 inches to 12 inches) and shank for use with ordinary bit brace. These differ from Ship Augers in the shank only.

Ship Auger Bits—Crucible Tool Steel, with or without screw; 8-inch twist and shank for use with ordinary bit brace.

Ship Augers

Size in 16ths	Twist, inches	Price Each	Price Dozen	Size in 16ths	Twist, inches	Price Each	Price Dozen
4 to 8	7 1/2 to 9 1/2	\$0.75	\$ 7.50	29 and 30	15	\$ 3.15	\$ 31.50
9 and 10	12	.90	9.00	31 " 32	15	3.80	38.00
11 " 12	12	1.05	10.50	33 " 34	15	5.70	57.00
13 " 14	12	1.20	12.00	35 " 36	15	7.20	72.00
15 " 16	12	1.35	13.50	37 " 38	15	8.60	86.00
17 " 18	12	1.50	15.00	39 " 40	15	10.10	101.00
19 " 20	15	1.65	16.50	41 " 42	15	11.50	115.00
21 " 22	15	1.80	18.00	43 " 44	15	13.00	130.00
23 " 24	15	2.10	21.00	45 " 46	15	14.40	144.00
25 " 26	15	2.40	24.00	47 " 48	15	15.80	158.00
27 " 28	15	2.55	25.50				

Ship Auger Car Bits

Size in 16ths	Price Each	Price Dozen	Size in 16ths	Price Each	Price Dozen
6	\$0.90	\$ 9.00	16	\$1.45	\$14.50
7	.95	9.50	17	1.55	15.50
8	1.00	10.00	18	1.60	16.00
9	1.05	10.50	19	1.70	17.00
10	1.10	11.00	20	1.75	17.50
11	1.15	11.50	21	1.85	18.50
12	1.20	12.00	22	1.90	19.00
13	1.25	12.50	23	2.15	21.50
14	1.30	13.00	24	2.20	22.00
15	1.40	14.00			

Ship Auger Bits

Size in 16ths	Price Each	Price Dozen	Size in 16ths	Price Each	Price Dozen
4	\$0.60	\$6.00	13	\$1.05	\$10.50
5	.60	6.00	14	1.05	10.50
6	.60	6.00	15	1.20	12.00
7	.60	6.00	16	1.20	12.00
8	.60	6.00	17	1.35	13.50
9	.75	7.50	18	1.35	13.50
10	.75	7.50	19	1.50	15.00
11	.90	9.00	20	1.50	15.00
12	.90	9.00			

AUGER HANDLES



No. 660



No. 1 and 2

No. 660. Made of selected hickory timber; common polish. Each.....\$0.25

No. 1. Made of ash with steel band operated by steel screw and thumb nut; 14 inches long. Per dozen.....\$6.00

No. 2. Same as No. 1, but 16 inches long. Per dozen.....\$6.00

BRIDGE AUGERS



For railroad construction, heavy bridge work, etc. Furnished to order only. Handles of any size, welded to bits with or without starting screw. Regular ship augers are generally used for welding to these handles, but we can furnish any style bit desired.

Prices Application

BARBER'S IMPROVED BRACES

Ball Bearing

Head has a bearing of steel balls running on hardened steel plates reducing friction to a minimum. Heavily nickel plated and warranted in every particular.



Sweep, inches	WITH RATCHET			WITHOUT RATCHET		
	No.	Price Each	Dozen	No.	Price Each	Dozen
8	33	\$3.50	\$42.00	13	\$2.40	\$28.80
10	32	3.00	36.00	12	2.70	32.40
12	31	2.50	30.00	11	3.00	36.00
14	30	4.20	50.40	10	3.30	39.60

BARBER'S IMPROVED BRACES

The sweeps to these braces are made of steel, polished, but not nickel plated. The heads and handles are stained in imitation of cocobolo. The threads are lathe cut, and all parts of the brace are made for durability.



With Ratchet and Alligator Jaws

No.	Sweep, inches	Price Each	Dozen
123	8	\$1.70	\$20.40
122	10	1.80	21.60
121	12	1.90	22.80

Without Ratchet—Plain Jaws

No.	Sweep, inches	Price Each	Dozen
23	8	\$0.90	\$10.80
22	10	1.00	12.00
21	12	1.10	13.20

SPOFFORD BRACES

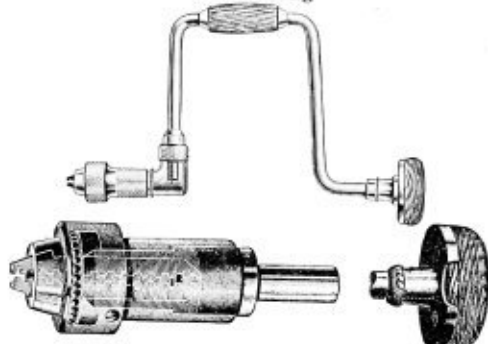


Nickel plated; cocobolo wood head and center; best forged steel thumb screw.

No.	Sweep, inches	Price Each	Dozen
108	8	\$2.40	\$28.80
110	10	2.70	32.40
112	12	3.00	36.00

P. S. & W. SAMSON RATCHET BRACE

Ball Bearing



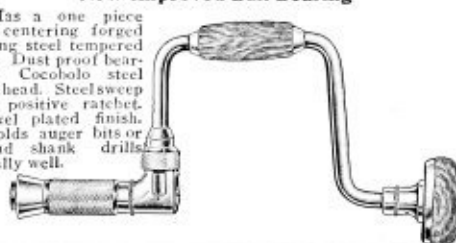
Has Sampson ball bearing chuck and forged steel alligator jaw, giving the tightest possible grip that can be obtained. Jaws are interlocking and will hold large expansive bits, auger bits or round shank drills equally well. Brace has dust proof ball-bearing, steel clad, lignum-vitae head, steel sweep, cocobolo center and positive ratchet.

No.	Sweep, inches	Price Each	Dozen
3200	14	\$6.00	\$72.00
3201	12	5.50	66.00
3202	10	5.20	62.40
3203	8	4.90	58.80
3204	6	4.70	56.40

P. S. & W. RATCHET BRACES

New Improved Ball Bearing

Has a one piece self centering forged spring steel tempered jaw. Dust proof bearing. Cocobolo steel clad head. Steel sweep and positive ratchet. Nickel plated finish. It holds auger bits or round shank drills equally well.



No.	Sweep, inches	Price Each	Dozen
3003	8	\$4.15	\$49.80
3002	10	4.50	54.00
3001	12	4.75	57.00
3000	14	5.15	61.80

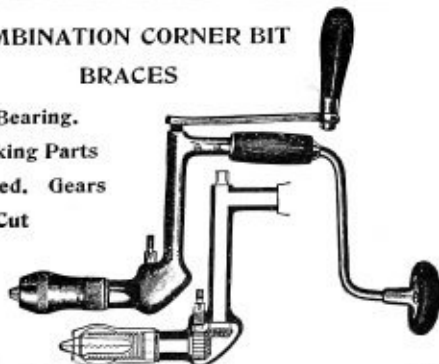
COMBINATION CORNER BIT BRACES

Ball Bearing.

Working Parts

Incase, Gears

Mill Cut



Price each, 10-inch sweep.....\$4.75

YANKEE BREAST DRILL



The peculiar advantage of this tool is the shifter on cylinder between the small gears, movement of which in the different notches causes the tool to perform different movements.

1st Notch—The drill is an ordinary breast drill.

2nd Notch—It becomes a left hand ratchet, useful in removing taps and especially to loosen drill if it becomes jammed.

3rd Notch—It becomes a right hand ratchet.

4th Notch—In this notch any movement of the crank in either direction, short or turned continuously, causes the chuck to turn to the right and drill continuously.

5th Notch—In this notch the spindle is locked tight so that the drill chuck can be rapidly opened or closed.

Extreme Length, 18 inches. Weight, 5½ lbs.

No. 530—Single Speed\$5.50

No. 555—Double Speed 6.50

No. 101 RECIPROCATING DRILL

For Iron, Brass or Wood



This tool has a wood traveling handle 4½ inches long, of polished cherry.

It has a steel Spiral with an angle slant of 20°. The head is of lignum vitae, supported by a heavy quill running in ball bearings.

The three-jawed chuck has a capacity to ¼ inch. The extreme length of the tool is 16 inches.

Price per dozen\$30.00

Price each 3.00

AUTOMATIC CHAIN DRILLS



These drills will be found very useful in connection with Bit Brace or Breast Drill in many places where it is not convenient to bring a ratchet drill into use.

FOR BIT STOCK DRILLS

Each.

No. 307. Automatic Feed\$3.00

No. 0307. Hand Screw Feed ... 2.50

FOR ROUND SHANK DRILLS

0 to ½ inch

Each.

No. 316. Automatic Feed\$5.00

No. 0316. Hand Screw Feed ... 4.50

FOR ½ INCH ROUND SHANK DRILLS

Each.

No. 0308. Hand Screw Feed ...\$1.50

YANKEE AUTOMATIC DRILL



No. 41

Made of steel and brass, nickel plated and buffed. Has eight drill points, 1-16 to 11-64 inches, which are in plain sight when magazine is open. During the return movement of handle the drill point revolves backward to clear chips, etc. Entire length of tool, inclusive of drill point, 11½ inches.

Price, including 8 pointseach, \$2.00

YANKEE AUTOMATIC DRILL

With Adjustable Tension



No. 44

Made of steel and brass, nickel plated and buffed. Length 11¼ inches. Has eight drill points 1-16 to 11-64 in magazine handle. Tension of spring can be adjusted for working in hard or soft wood by turning cap on top of drill. When drill is being inserted in chuck, open end of magazine handle is up so it can be left open without drills falling out.

Price, including 8 pointseach, \$2.25

No. 108 AUTOMATIC DRILL



The shanks of the drill points are so milled that when properly fastened in the chuck they can not be pulled out when in use.

Eight drill points, varying in size from 1-16 to 11-64, furnished with each tool.

The drill itself without any points is 9½ inches long, full polished and nickel plated.

Price per dozen\$30.00

Price each 3.00

HAND DRILLS—Millers Falls



No. 1



No. 2



No. 3



No. 5



No. 7

No. 1—Length over all 12 inches. Provided with nickel-plated chuck having three jaws resting in solid sockets; Cocobolo handles; holds drills from 0 to $\frac{1}{8}$. **Each**, including 8 fluted points in hollow handle.....\$1.50 **Dozen**....\$15.00

No. 2—Length over all 11 inches. Ball bearing; cut gears; adjustable friction roll; same in general finish as No. 1. Holds drills from 0 to $\frac{1}{4}$. **Each**, including 8 fluted points.....\$3.00 **Dozen**....\$30.00

No. 3—Length over all 11 inches. Handle is hollow and easily detached from stock. The cell in the handle is sufficiently deep to enclose twist drill, etc., commonly used with hand drills. Holds drills from 0 to $\frac{1}{8}$. **Each**, without bits.....\$1.20 **Dozen**....\$12.00

No. 5—Length over all 11½ inches. Same general finish as No. 1, but double geared and provided with wide rim gear, to be grasped between thumb and fingers when drill is used for delicate work. Thus it can be run without liability of breaking points. **Each**, including 8 fluted points.....\$1.80 **Dozen**....\$18.00

No. 7—Length over all 12½ inches. Drive gear, 4-inch diameter; holds drills from 0 to $\frac{1}{4}$; metal parts, with exception of gear, are polished; hardwood handles stained in imitation of cocobolo. **Each**, without bits.....\$2.10 **Dozen**....\$21.00

HAND DRILLS—Goodell-Pratt



No. 4½



No. 05



No. 5½



No. 5½ B

No. 4½—Length over all 11 inches. Three-jawed chuck; will hold drills $\frac{1}{8}$ to No. 80. **Each**, including 8 fluted points.....\$2.00 **Dozen**....\$20.00

No. 05—Length over all 12 inches. The same generally as No. 4½, but larger and heavier; will hold drills $\frac{1}{4}$ -inch to No. 80. **Each**, without drill points.....\$2.70 **Dozen**....\$27.00

No. 5½—Length over all 14½ inches. Double gears, with cut teeth; two speeds; chuck capacity to $\frac{3}{8}$ -inch; cocobolo handle; Japanese frame. **Each**, without drill points.....\$4.20 **Dozen**....\$42.00

No. 5½ B—Same as No. 5½, except handle, which is made for combination hand or breast drill instead of hollow for holding drills. **Each**, without drill points.....\$4.20 **Dozen**....\$42.00

BREAST DRILLS



No. 10



No. 12



No. 13



No. 19

No. 10. Ball bearings; nickel plated stock and chuck; cocobolo handles; extension crank; new alligator jaws holding round and square shanks; patent level attachment for holding tool true. Cut gears, changeable from even to speeded 3 to 1.

Price each.....\$3.60 Per dozen.....\$36.00

No. 12. Ball bearing, changeable cut gears from even to 3 to 1. Drive wheel 5-inch diam.; crank is adjustable to 3 different lengths, held in place by round head thumb screw with milled edges; nicked chuck with new alligator jaws for round and square shanks from 5-64 up.

Price each.....\$3.00 Per dozen.....\$30.00

No. 13. Double geared; ball bearings; 6-inch drive wheel; speed $4\frac{1}{2}$ to 1. Gears are cut; handles, cocobolo; stock and chuck nickel plated.

Price each.....\$4.20 Per dozen.....\$42.00

No. 19. Ball bearings; alligator jaws; drive wheel 5-inch diam.; gears changeable from even to 3 to 1; crank adjustable to variation of $3\frac{1}{2}$ inches in length. Stock and chuck polished.

Price each.....\$2.10 Per dozen.....\$21.00

No. 15. Same as No. 12, except it has a "D" handle instead of breast plate for use in places where a drill cannot be used.

Price each.....\$3.00 Per dozen.....\$30.00

No. 6 BREAST DRILL

For Round Shank Drills



It has a three-jawed chuck capacity 0 to $\frac{1}{2}$ inch. It is double geared, one gear remaining "idle" and acting as an anti-friction bearing when the other is at work. All gears have cut teeth. It has two speeds and can be changed from fast to slow by turning the thumb nut at "A" until the letter representing desired speed is nearest the chuck. The breast plate is adjustable and its position can be changed if desired.

Price, each.....\$4.75

GIANT BREAST DRILLS

Nos. 58, 59 and 60

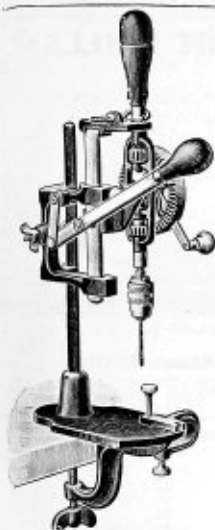
Built for heavy, hard work, assuring the user a machine of great power and strength, will easily carry drills to full capacity. Weight of all three sizes thirteen lbs. The larger size has tubular shafts and leather breast-plate to minimize weight; provided with two speeds, cut gears, malleable crank, three-jawed chuck.

No.	Capacity, inches	Price Each
58	0 to $\frac{1}{2}$	\$10.00
59	0 to $\frac{3}{4}$	12.00
60	0 to 1	10.00

No. 60 has Two Morse Taper Sockets for holding drills instead of chuck as Nos. 58 and 59 are equipped.



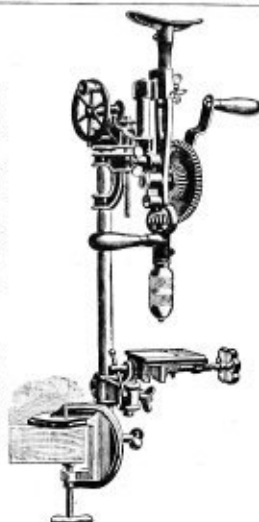
BENCH DRILLS



No. 22

No. 22 is of very simple construction, made to meet the demand for an effective, low priced drill. For use in connection with Hand Drills, Nos. 1, 2 and 5, which may be attached to the frame in a very few seconds. Speed is changed by compound lever which is convenient, sensitive and effective. Frame is steel and iron, japanned finish. With Hand Drills No. 1 and 5, the distance between chuck and table at highest point is $7\frac{1}{4}$ inches. With Hand Drill No. 2 $6\frac{1}{2}$ inches. Weight $7\frac{1}{2}$ pounds. Height over all $15\frac{1}{2}$ inches.

No. 20 is used with No. 10, 12 or 15 Breast Drill. Bench clamp, vise rest and frame are securely clamped to main standard and can be moved up or down, swung to right or left or clamped at any desired point. Table can be used either as a vise or table and is hung on an eccentric pin to admit of a variety of positions.



No. 20

No. 22 price of frame only.....	each, \$1.75
No. 22 price of frame complete with Hand Drill No. 1.....	3.00
No. 22 price of frame complete with Hand Drill No. 5.....	3.25
No. 22 price of frame complete with Hand Drill No. 2.....	4.25
No. 20 price of frame only (without Breast Drill).....	4.00

BENCH DRILLS

Nos. 8, $8\frac{1}{2}$, 9 and $9\frac{1}{2}$ 

No. 9

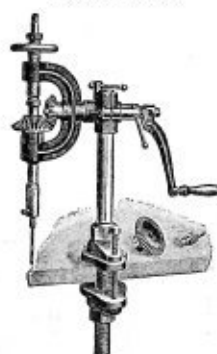
No. 8, a substantial machine, with solid iron frame, cut gears, steel feed screw, and adjustable table. Furnished complete with three-jawed chuck, capacity 0 to $\frac{3}{4}$ inch, and eight fluted drills, $\frac{1}{16}$ to $\frac{1}{4}$ inch. Height from table to feed wheel 13 inches. Weight 13 pounds. Price, each.....\$5.00

No. $8\frac{1}{2}$, same as No. 8, with additional equipment of a special vise, for use in place of table. Jaws of vise open $1\frac{1}{2}$ inches and operate on a right and left hand screw. Price, each.....\$6.50

No. 9, same as No. 8, but larger and heavier. Solid iron frame, cut gears, and two different speeds, quickly changed by a shifter, adjustable table, steel feed screw, all well made and fitted. Furnished complete with three-jawed chuck, capacity 0 to $\frac{3}{4}$ inch, and eight fluted drills. Height from table to feed wheel 18 inches. Drill points furnished $\frac{1}{16}$ to $\frac{1}{4}$ inch. Weight 20 pounds. Price, each.....\$8.00

No. $9\frac{1}{2}$, same as No. 9, with additional equipment of special vise (as No. $8\frac{1}{2}$). Vise jaws open 2 inches. Weight 25 lbs. Price, each.....\$10.00

ANGULAR AND RATCHET DRILLING MACHINES



These machines have steel standards, shafts and spindles. They are suitable for the bench and can be attached to broken machines and swung around so as to drill at a variety of angles. By attaching the crank to drill spindle, it can be used with or without ratchet. The hole in spindle is suitable for drills with $\frac{1}{2}$ inch shanks. With each machine we send as sample one such drill $\frac{1}{4}$ inch, also a chuck to hold straight shanked drills from 0 to $\frac{1}{2}$ inch.

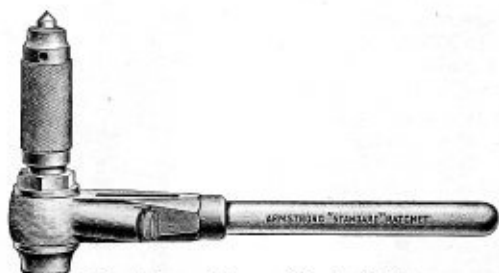
No. 1. Speeded. Weight 34 pounds. Drills holes up to $\frac{3}{4}$ inch.....\$20.00

No. 2. With two sets of gears making either speeded or geared back machine. Weight 64 lbs. Drills holes up to 1 inch.....\$25.00

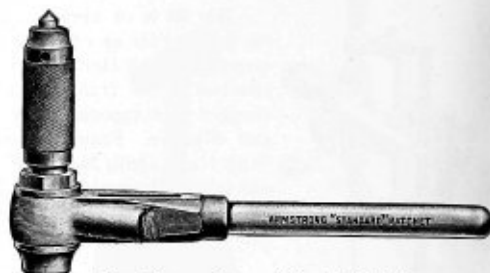
No. 3. Geared back. Weight, 108 lbs. Drills holes up to $1\frac{1}{2}$ inch.....\$40.00

Spindles to order with hole for taper socket when required, extra, net.....\$1.50

ARMSTRONG "STANDARD" REVERSIBLE RATCHET DRILLS

**For Square Taper Shank Drills**

Improved design, all steel, hardened all over. No drift is needed, as drill is discharged by feed screw.

**For Morse Taper Shank Drills****For Square Taper Drills**

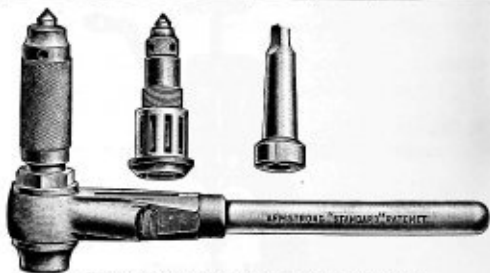
Number	Length, inches	Size of Drill Socket	Length of Head, inches	Feed, inches	Price Each
9	9	Bit Stock Taper	5	2	\$4.75
12	12	No. 1 Square Taper*	6	2 1/4	5.00
15	15	" 1 " "	6 3/4	2 1/2	5.75
18	18	" 1 " "	7 3/4	3	6.75
22	22	" 2 " "	9	3 1/2	7.75

For Morse Taper Shank Drills

Number	Length, inches	Size of Drill Socket	Takes Morse Taper Drills, inches	Length of Head, inches	Feed, inches	Price Each
9-M	9	No. 1 Morse	1/8 to 3/8	5	2	\$5.00
12-M	12	" 2 "	3/8 to 1/2	6	2 1/4	5.25
15-M	15	" 3 "	1/2 to 5/8	6 3/4	2 1/2	6.00
18-M	18	" 3 "	5/8 to 3/4	7 3/4	3	7.00
22-M	22	" 4 "	3/4 to 1	9	3 1/2	8.00

**"Standard" Boiler Ratchet
For Square Taper Shank Drills**

The combination includes sleeve ratchet for Morse Taper Shank Drills, Screw Taper Socket to fit same and short spindle with set screw, by means of which the ratchet can be converted into a boiler ratchet or adapted to receive square taper shank drills.

**"Standard" Combination Ratchet****"Standard" Boiler Ratchet—For Square Taper Drills**

Number	Length, inches	Size of Drill Socket	Length of Head, inches	Feed, inches	Price Each
9-B	9	Bit Stock Taper	3 1/4	1 1/8	\$4.50
12-B	12	No. 1 Square Taper*	4 3/8	1 1/2	4.75
15-B	15	" 1 " "	5	1 3/4	5.50
18-B	18	" 1 " "	5 1/2	2	6.50
22-B	22	" 2 " "	6	2 1/4	7.50

"Standard" Combination Ratchet

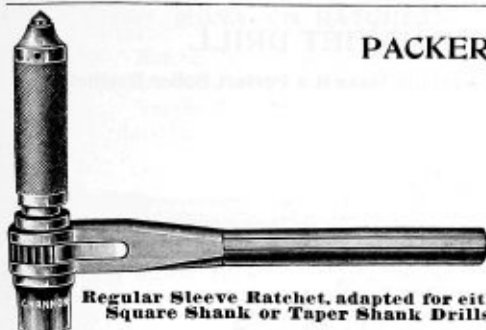
Number	Length, inches	Size of Drill Socket	Price Each
9-C	9	Bit Stock & No. 1 Morse	\$ 7.50
12-C	12	No. 1 Sq. Taper " 2 "	7.75
15-C	15	" 1 " " " 3 "	9.00
18-C	18	" 1 " " " 3 "	10.75
22-C	22	" 2 " " " 4 "	11.50

*No. 1, or small drill socket, is 3/8 inch square at small end and 1/2 inch square at large end.

†No. 2, or large drill socket, is 1/2 inch square at small end and 3/4 inch square at large end.

Each Ratchet is Packed in a Cardboard Box

PACKER RATCHETS



Regular Sleeve Ratchet, adapted for either Square Shank or Taper Shank Drills



Boiler Ratchet. Will take Square Shank Drills Only

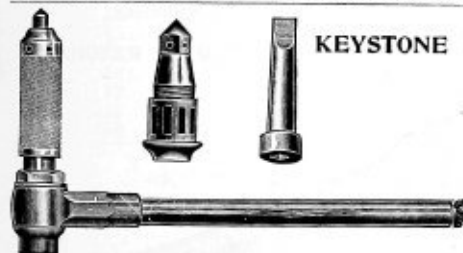
SLEEVE RATCHETS

For Square Shank Drills				For Taper Shank Drills			
Number	Length Handle, inches	Socket	Price Each	Number	Length Handle, inches	Socket Taper	Price Each
1	10	No. 1 Sq. Taper	\$10.50	2A	12	No. 2 Morse	\$16.00
2	12	" " " "	13.50	3A	16	" 3 "	20.00
3	16	" " " "	16.00	4A	17	" 4 "	25.00
4	18	No. 2 Sq. Taper	19.00				
5	24	" " " "	23.00				

BOILER RATCHETS—For Square Shank Drills Only

Number	Length Handle, inches	Price Each
1	10	\$ 9.00
2	12	10.50

KEYSTONE REVERSIBLE RATCHETS



Combination Ratchet



Boiler Ratchet

For Square Shank Drills Only

Number	Length Handles, inches	Style Ratchet	Price Each
1	10	Sleeve	\$5.00
2	14	"	5.75
3	16	"	6.50
4	18	"	7.25

For Morse Taper Shank Drills Only

Number	Length Handles, inches	Style Ratchet	Price Each
21	10	Sleeve	\$5.25
22	14	"	6.00
23	16	"	6.75
24	18	"	7.50

Boiler Ratchet for Square Shank Drills Only

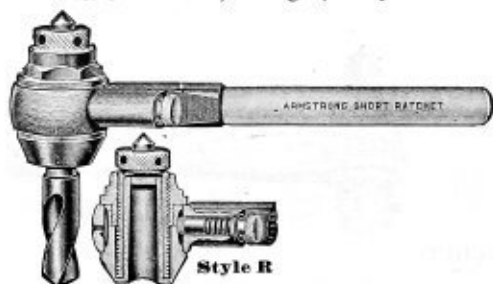
Number	Length Handles, inches	Style Ratchet	Price Each
31	10	Boiler	\$5.00
32	14	"	5.75
33	16	"	6.50
34	18	"	7.25

Combination Sleeve and Boiler Ratchet for Square or Taper Shank Drills

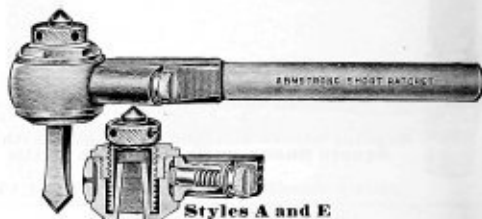
Number	Length Handles, inches	Style Ratchet	Price Each
51	10	Combination	\$ 7.75
52	14	"	9.00
53	16	"	10.00
54	18	"	11.25

THE ARMSTRONG SHORT RATCHET DRILL

Its Short Head, Strength, Compactness and Quick Reverse Make it a Perfect Boiler Ratchet



Style R



Styles A and E

Has a long feed and a short head, making it especially desirable for drilling in small, cramped and crowded places.

Style	Length of Handle, inches	Length of Head, inches	Feed, inches	For Drill With	Price Each
A2	12	2 3/4	1 1/2	No. 1 Taper Square Shank	\$ 8.00
A3	18	2 3/4	1 1/2	" " " " "	10.00
E2	12	2 3/4	1 1/2	" " " " "	8.00
E3	18	2 3/4	1 1/2	" " " " "	10.00
R2	12	3 3/4	2 1/2	" 3 Morse " " "	8.00
R3	18	3 3/4	2 1/2	" " " " "	10.00

Extra Spindles, Styles A, E, or R, with nut and feed screws.....\$3.50
 Socket Fitted to No. 3 Morse Taper, taking taper square shank.....1.25

Style R spindles for No. 3 Morse Shanks are interchangeable with A and E spindles.

THE RENSHAW RATCHET DRILL



These tools are made in two sizes—No. 1 taking drills to 1/2 inch, No. 3 taking drills to 1 1/4 inches. All the parts are made from steel and hardened.

No. 1 has one collet for drills, with shank 1 1/2 inch square at shoulder, and one collet for drills fitting No. 1 Morse's standard taper socket.

No. 3 has one collet, No. 5, for drills, with shank 1 1/2 inch square at shoulder, of 1/2 to 1 1/2 inches diameter, which are the extreme sizes that this ratchet is adapted to carry, and collets Nos. 1, 2 and 3, for Morse's standard taper shanks. No. 3 and No. 5 collets are held in the spindle by screw thread. No. 1 and No. 2 collets are tapered externally to fit No. 3 socket.

No.	Length of Handle	Depth of Head	Depth of Feed	With Collets	Price Each
1	9 1/2"	3"	1 1/2"	With 2 Collets	\$11.00
1	9 1/2"	3"	1 1/2"	" 1 "	9.40
3	18"	5"	2 3/4"	" 4 "	15.00
3	18"	5"	2 3/4"	With No. 3 or 5 Col.	11.05
3	18"	5"	2 3/4"	" " 1, 2 or 3 "	13.25

No. 1 Collet with square or taper hole.....\$1.60
 " 1 or 2 Collet for No. 3 Ratchet.....1.10
 " 3 or 5 " " " " ".....1.75

ARMSTRONG UNIVERSAL RATCHET



Will drive drill in any position where it is possible to move handle in any direction.

Made in two sizes, No. 4 made for general use in machine shops and structural iron and bridge work, No. 6 for extra heavy drilling in all classes of material.

No.	Length, inches	Feed, inches	Capacity	*Price
4	12	1 1/2	To 1-in. hole	\$12.00
6	18	2 1/4	" 2-in. "	18.00

*Price includes one spindle only.

Extra Spindles

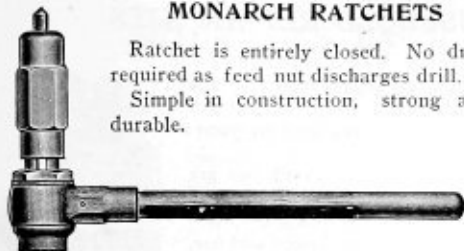
Style	Fitting Ratchet	Taking Drills	Price
M	No. 4	With No. 1 Sq. Tap. Sh.	\$2.40
K	" 4	" " 2 Morse "	2.40
F	" 6	" " 2 Sq. Tap. Sh.	3.60
N	" 6	" " 3 Morse "	3.60
S	" 6	" " 4 " " "	3.60

NOTE—Regular Morse Taper Reducing Sleeves can be used in K, N and S spindles. Always specify style spindle wanted. Unless so done we will ship No. 4 Ratchet with M spindle, No. 6 with F.

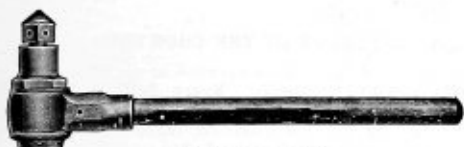
MONARCH RATCHETS

Ratchet is entirely closed. No drift required as feed nut discharges drill.

Simple in construction, strong and durable.

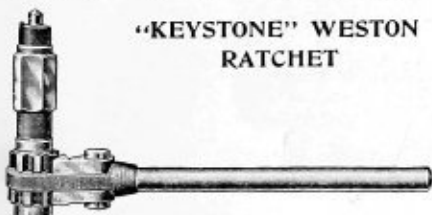


For Morse Taper Shank Drills



Boiler Ratchet

No.	Length Handle, inches	Kind	For Drills Suitable	Price Each
10	10	Sleeve	Square Shank	\$5.00
20	12	Sleeve	Square Shank	5.50
30	15	Sleeve	Square Shank	6.00
40	18	Sleeve	Square Shank	7.50
110	10	Sleeve	Taper Shank	5.25
120	12	Sleeve	Taper Shank	5.75
130	15	Sleeve	Taper Shank	6.25
140	18	Sleeve	Taper Shank	7.75
210	10	Boiler	Square Shank	5.00
220	12	Boiler	Square Shank	5.50
230	15	Boiler	Square Shank	6.00
240	18	Boiler	Square Shank	7.50



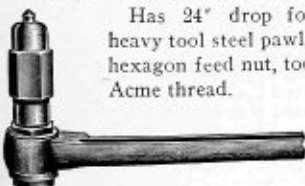
"KEYSTONE" WESTON RATCHET

No. 1 Standard Square Taper $5\frac{1}{8} \times 3\frac{1}{8} \times 1\frac{1}{2}$ long on 12" and 14" Ratchets and No. 2 Standard Square Taper $3\frac{1}{4} \times 1\frac{1}{2} \times 1\frac{1}{4}$ long on 16".

Length Handle, inches	12	14	16
Price, Style "A" Regular.....	\$7.60	\$8.00	\$8.75
Price, Style "B" Boiler Makers'	8.00	.....	.....

"GIANT" RAILROAD TRACK RATCHET

Has 24" drop forged steel handle, heavy tool steel pawl, solid steel socket, hexagon feed nut, tool steel feed screw, Acme thread.



324A. 24-inch handle.....\$9.00

"KEYSTONE" NEW DRILL SLEEVES For Blacksmiths' or Straight Shank Drills



Number	Sleeve for Round Shank Drills, inches	Price
0	$\frac{1}{2}$	\$1.25
00	$\frac{3}{8}$	1.25
01	$\frac{1}{2}$	1.50
001	$\frac{3}{8}$	1.50

Nos. 0 and 00 have No. 1 Standard Square Taper Shank.

Nos. 01 and 001 have No. 2 Standard Square Taper Shank.

Order by Figure Number.

SQUARE SHANK DRILL SLEEVE



Size Outside Taper	Price
No. 2	\$1.00
No. 3	1.25
No. 4	1.50

Order by Number of Taper.

DRILLING POST "Old Man"

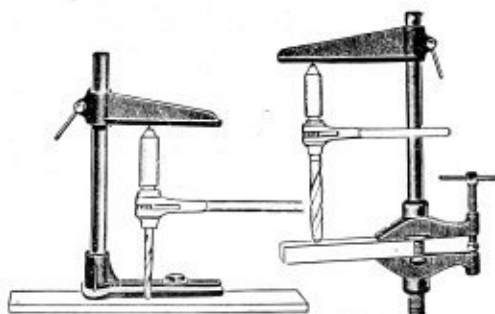


Fig. 100

Fig. 200

Figure 100

No.	Capacity, inches	Radius, inches	Price
1	To $\frac{3}{4}$	10	\$ 8.00
2	To $1\frac{1}{2}$	12	10.00

Figure 200

No.	Capacity, inches	Radius, inches	Price
3	To $\frac{3}{4}$	10	\$ 8.00
4	To $1\frac{1}{2}$	12	10.00

Price does not include Ratchet.

AUTOMOBILE, LAUNCH AND HOUSEHOLD REPAIR KITS



AUTO-KITS

Have you an automobile or launch?

Do you do your own repairing or are you paying some one else for doing it?

Do you know that eight out of ten breaks could be repaired by yourself if you had the proper set of tools?

Why not do your own repairing and save some of the money you are expending?

A Channon kit is not expensive and it will pay for itself in a short time.

Every tool in our kits is a practical tool—one that you will need and use, and the quality could not be better. **They never break.**



AUTO-KITS

THE CHANNON LINE OF AUTO KITS

CONTAINS THE PRODUCT OF THE BEST TOOL MANUFACTURERS IN THE COUNTRY

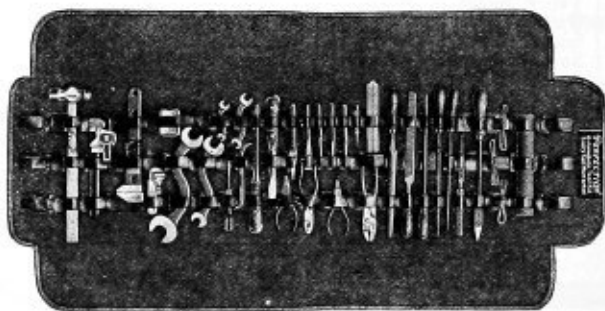
We are direct representatives for these manufacturers; we make the cases in our own Canvas Factory; we assemble the tools in our own Tool Room and inspect every one carefully. Every Outfit is Fully Warranted.

These kits are serviceable not only as Automobile or Launch repair kits, but wherever there is small or tinkering work to be done. In a household, many uses can be found for the different tools.

The Channon Auto Kits are unexcelled and by far the most extensive line on the market. They have been made up with the judgment of long experience which insures their practicability and quality. We believe the different outfits cover most all requirements, however, we are prepared to make up Special Outfits and deliver promptly.

"PERFECTION" AUTO KIT OUTFIT

This kit contains all the essential tools for making repairs on the road, together with complete soldering outfit, and can be relied upon for general use at all times. Every tool is strictly high grade, fully warranted, and especially adapted for purpose intended. The case is of heavy brown duck, with retaining straps securely fastened with double rows of copper rivets.



Price Each, \$19.00

CONSISTS OF 36 TOOLS

Drop Forged Wrench for $\frac{1}{4}$ and $\frac{3}{8}$ -inch nuts.
Drop Forged Wrench for $\frac{3}{8}$ and $\frac{1}{2}$ -inch nuts.
Drop Forged Wrench for $\frac{5}{8}$ and $\frac{3}{4}$ -inch nuts.
10-inch Auto Monkey Wrench.
10-inch Stillson Pipe Wrench.
 $\frac{3}{4}$ -lb. Ball Pein Hammer.
9 $\frac{1}{2}$ -inch Machinist Perfect Handle Screw Driver.
5-inch Perfect Handle Screw Driver.
8-inch N. P. Combination Plier.
6-inch Side Cutting Plier.
Soldering Copper—tinned ready for use.
File Handle.
8-inch Mill Bast. File.
8-inch Slim Taper File.
8-inch Square Bast. File.

8-inch Round Bast. File.
2 File Handles, Nicholson.
1 Bearing Scraper.
N. P. Cotter Pin Extractor.
 $\frac{3}{8}$ -inch Cold Chisel.
 $\frac{1}{4}$ -inch Cold Chisel.
Machine Punch—small.
Machine Punch—medium.
Knurled Center Punch.
No. 18 Soft Copper Wire.
No. 20 Soft Copper Wire.
Self Fluxing Wire Solder.
Box Assorted Cotters.
Box Assorted Nut Locks.

If you do not need a kit as complete as the "Perfection," we can furnish smaller ones which are described on the next page.

AUTOMOBILE, LAUNCH AND HOUSEHOLD KITS—Continued



"RELIANCE" AUTO KIT OUTFIT

This kit contains all the essential tools for making repairs on the road, together with complete soldering outfit, and can be relied upon for general use at all times. Every tool is strictly high grade, fully warranted, and especially adapted for purpose intended. The case is of heavy brown duck, with retaining straps securely fastened with double rows of copper rivets.



Drop Forged Wrench for $\frac{1}{4}$ and 5-16-inch nuts.
Drop Forged Wrench for $\frac{3}{8}$ and $\frac{1}{2}$ -inch nuts.
Drop Forged Wrench for $\frac{3}{4}$ and $\frac{1}{2}$ -inch nuts.
10-inch Auto Monkey Wrench.
10-inch Stillson Pipe Wrench.
 $\frac{3}{4}$ -lb. Ball Pein Hammer.
 $\frac{9}{16}$ -inch Machinist Perfect Handle Screw Driver.
5-inch Perfect Handle Screw Driver.
8-inch N. P. Combination Plier.
6-inch Side Cutting Plier.
Soldering Copper—tinned ready for use.

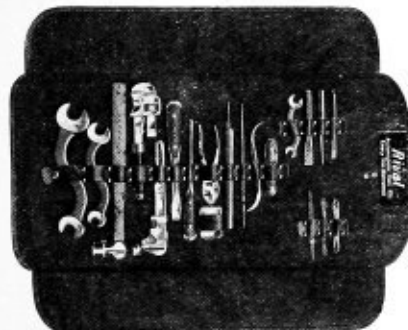


Price Each, \$12.00. Consists of 29 Tools.

File Handle.
8-inch Mill Bast. File.
8-inch Slim Taper File.
8-inch Square Bast. File.
8-inch Round Bast. File.
2 File Handles, Nicholson.
1 Bearing Scraper.
N. P. Cotter Pin Extractor.
 $\frac{1}{2}$ -inch Cold Chisel.
 $\frac{1}{4}$ -inch Cold Chisel.
Machine Punch—small.
Machine Punch—medium.
Knurled Center Punch.
No. 18 Soft Copper Wire.
No. 20 Soft Copper Wire.
Self Fluxing Wire Solder.
Box Assorted Cutters.
Box Assorted Nut Locks.

"RIVAL" AUTO KIT OUTFIT

This outfit contains the most essential tools. Every one is indispensable and fully warranted. Mounted in a heavy duck case, with double riveted retaining straps. As a practical outfit this kit rivals any on the market.



Price Each, \$9.50

Consists of 21 Tools

Drop Forged Wrench for $\frac{1}{4}$ and 5-16-inch nuts.
Drop Forged Wrench for $\frac{3}{8}$ and $\frac{1}{2}$ -inch nuts.
Drop Forged Wrench for $\frac{3}{4}$ and $\frac{1}{2}$ -inch nuts.
10-inch Stillson Pipe Wrench.
9-inch N. P. Auto Wrench.
 $\frac{3}{4}$ -pound Ball Pein Hammer.
 $\frac{9}{16}$ -inch Machine Perfect Handle Screw Driver.
5-inch Perfect Handle Screw Driver.
6-inch N. P. Combination Plier.

8-inch Half Round Bastard File.
8-inch Round Bastard File.
4-inch Warding Bastard File.
File Handle.
 $\frac{3}{4}$ -inch Cold Chisel.
 $\frac{1}{2}$ -inch Cold Chisel.
Knurled Center Punch.
No. 4 Machine Punch.
N. P. Cotter Pin Extractor.
Box Assorted Spring Cutters.
No. 20 Soft Copper Wire.
No. 18 Soft Copper Wire.

"CHALLENGE" AUTO KIT OUTFIT

This set is comprised of tools that are indispensable. Fully warranted. The case is of heavy duck and the retaining straps double riveted.



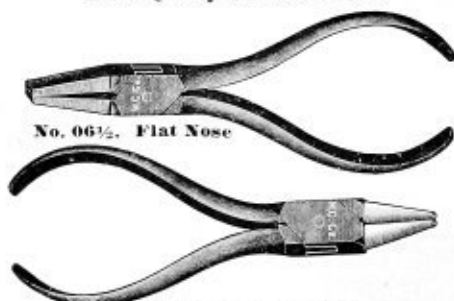
Price Each, \$5.50

Consists of 15 Tools

Drop Forged Wrench for $\frac{1}{4}$ and $\frac{1}{2}$ -inch nuts.
Drop Forged Wrench for $\frac{3}{8}$ and $\frac{1}{2}$ -inch nuts.
9-inch N. P. Auto Wrench.
10-inch Stillson Pipe Wrench.
 $\frac{3}{4}$ -lb. Ball Pein Hammer.
6-inch N. P. Combination Plier.
8-inch Mill Bast. File.
8-inch Round Bast. File.
6-inch Slim Taper File.
File Handle.
6-inch Screw Driver.
 $\frac{3}{4}$ -inch Flat Cold Chisel.
No. 4 Machine Punch.
No. 20 Soft Copper Wire.
N. P. Cotter Pin Extractor.

FLAT AND ROUND NOSE PLIERS

Extra Quality Stub's Pattern

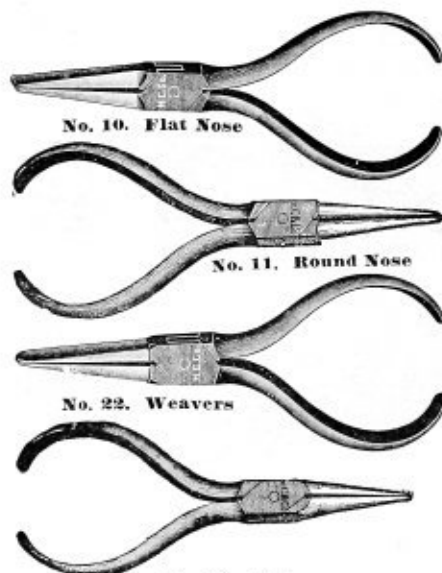


No. 06 1/2. Flat Nose

No. 07 1/2. Round Nose

No.	Price Each	Price per Dozen	No.	Price Each	Price per Dozen
3 1/2	\$0.35	\$3.40	6	\$0.60	\$5.75
4	.35	3.45	7	.85	8.50
5	.45	4.30	8	1.05	10.50

LONG NOSE PLIERS

Flat Nose, Round Nose Weavers and Chain
Extra Quality. Stub's Pattern
Box Joints

No. 10. Flat Nose

No. 11. Round Nose

No. 22. Weavers

No. 13. Chain

No.	Price Each	Price per Dozen	No.	Price Each	Price per Dozen
3 1/2	\$0.35	\$3.55	6	\$0.60	\$ 5.60
4	.40	3.60	7	.85	8.20
5	.45	4.25	8	1.00	10.00

Chain Pliers furnished up to 6 inch only.

COMBINATION PLIERS

Gas plier, wire cutter, wrench and screw-driver combined.



Size, inches	BLACK		NICKEL PLATED	
	Each	Dozen	Each	Dozen
6	\$1.35	\$13.50	\$1.50	\$15.00
8	1.60	16.00	1.80	18.00
10	1.80	18.00	2.10	21.00

IMPROVED COMBINATION PLIERS



No. 80. Polished

Size, inches	Price Each	Price per Dozen
6	\$0.90	\$ 9.00
7	1.00	10.00
8	1.15	11.50

BURNER PLIERS

Forged Steel. Polished



Size, inches	Price Each	Price per Dozen
5	\$0.60	\$ 6.00
6	.70	7.00
7	1.00	10.00

GAS PLIERS

Forged Steel. Polished



Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
7	\$0.80	\$ 8.00	11	\$1.35	\$13.50
8	.90	9.25	12	1.45	14.50
9	1.00	10.25	14	1.80	18.00
10	1.25	12.50			

BUTTON'S PLIERS

Forged Steel



Size, inches	Will Cut Wire No.	Price Each	Price per Dozen
4 1/2	14	\$1.00	\$10.00
6	11	1.20	12.00
8	8	1.50	15.00
10	6	2.00	20.00
12	5	2.40	24.00

SIDE CUTTING PLIERS**Forged Steel. Box Joint****No. 64**

Length, inches	Price, Each	Price, per Dozen
4	\$0.60	\$ 5.90
5	.70	6.80
6	.85	8.25
7	1.10	11.00
8	1.55	15.25

SIDE CUTTING NIPPERS**P. S. & W. No. 30 Black****Forged Steel, Star Rivet, Box Joint, Raised Cutters, Superior Quality**

Size, inches	Price, Each	Price, per Dozen
5	\$1.25	\$12.50
6	1.35	13.50
7	1.70	17.00
8	2.00	20.00

DIAGONAL CUTTING NIPPERS**No. 53**

Size, inches	Price, Each	Price, per Dozen
4	\$0.65	\$ 6.40
5	.70	6.90
6	.90	8.75
7	1.10	11.00
8	1.45	14.30

LINEMAN'S PLIERS**Klein Pattern, Extra Heavy, Hand Forged**

Size, inches	Price, Each	Price, per Dozen
6	\$1.65	\$16.50
7	2.00	20.50
8	2.40	24.00
9	3.50	35.00

END CUTTING NIPPERS**Extra Quality Cast Steel, Hand Forged, Stub's Pattern****No. 850 1/2**

Size, inches	Price, Each	Price, per Dozen
4	\$0.65	\$ 6.40
5	.65	6.40
6	.75	7.80
7	1.10	11.25
8	1.50	14.80

CAREW'S PATENT WIRE CUTTER**Forged Steel, with Adjustable Jaws of Tool Steel**

Size, inches	Price, per Pair	Extra Jaws, Price, per Pair
6	\$1.75	\$0.50
8	2.00	.55
10	2.25	.60
12	2.60	.65
14	3.00	.70

LONG NOSE ELECTRICIANS' SIDE CUTTING PLIERS**Extra Long Jaws****No. 72**

Size, inches	Price, Each	Price, per Dozen
5	\$0.80	\$8.00
5 1/2	.85	8.50
6	.95	9.50

BERNARD PATENT PLIERS

Open Throat, Parallel Jaws, Full Nickel Plated
Made of Crucible Steel



No. 100 Flat Nose



No. 101 Round Nose

PRICES OF Nos. 100 AND 101:

Size, inches	Each	Price per Dozen
4½	\$0.70	\$ 7.00
5½	.90	9.00
6½	1.10	11.00
7½ ex. h'vy	1.50	15.00



No. 102 CUTTING PLIERS

Size, inches	Price Each	Price per Dozen
4½	\$1.15	\$11.50
5½	1.45	14.50
6½	1.75	17.50
7½ ex. h'vy	2.35	23.50



No. 113 VISE PLIERS

Can be used as a wrench, plier and hand vise

Size, inches	Price Each	Price per Dozen
5	\$1.00	\$10.00
6½	1.30	13.00

Price each will apply on orders for less than ½ dozen of a size of any of the Bernard pliers.

BERNARD NIPPERS

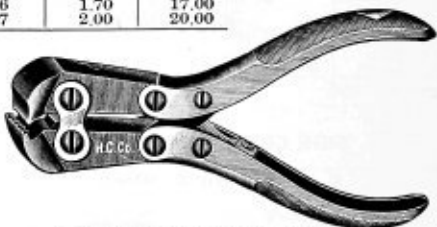
Made of Crucible Steel
Open throat jaws, full nickel-plated,
interchangeable parts



No. 125 END CUTTING NIPPERS

Size, inches	Price Each	Price per Dozen
4	\$1.10	\$11.00
5	1.40	14.00
6	1.70	17.00
7	2.00	20.00

Its compound system of leverage makes this tool a very powerful cutter.



No. 135 MUSIC WIRE NIPPERS

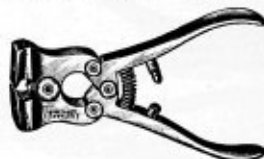
Especially made for cutting hardened steel wire

Size 5 inch, price each.....\$1.80 Per dozen.....\$18.00

STARRETT'S No. 199 CUT-NIPPER

Cuts to extreme edge of jaw; all parts interchangeable.

5-inch.....\$1.50
Jaws, per pair.....1.00
Jaws, each......50

ADJUSTABLE JAW CUT-NIPPER

5½-inch, M (for music wire).....\$2.00
5½-inch C (for common use).....2.00
5½-inch B (for bicycle use).....2.00
7-inch, either M, C, or B.....2.50
Extra jaws either M, C, or B, which should be designated as above, per pair......50

Unless otherwise ordered, Cut-Nippers with M jaws will be sent.

BOLT CLIPPERS

**"New Easy" Bolt and Rivet Clipper****"Carolus" Nut Splitter and Bolt Clipper**

"NEW EASY"; made of best material obtainable and in the most careful manner. All parts are interchangeable.

"CAROLUS"; jaws are drop-forged from highest grade steel and are strongly re-inforced. All screws are of steel, carefully hardened. Handles are made extra strong. Will cut at any angle.

"NEW EASY"**"CAROLUS"**

No.	Cuts Bolts up to inches	Length, inches	Weight, Lbs.	Price, Each	Price Jaws, Per Set	No.	Cuts Bolts to inches	Splits Nuts, inches	Price per Pair
0	$\frac{5}{16}$	18	3	\$3.75	\$1.35	1N	$\frac{3}{8}$	$\frac{1}{4}$ to $\frac{3}{8}$	\$5.00
1	$\frac{3}{8}$	24	5 $\frac{1}{4}$	5.00	1.65	2N	$\frac{1}{2}$	$\frac{3}{8}$ to $\frac{1}{2}$	9.00
2	$\frac{1}{2}$	30	7 $\frac{1}{2}$	7.00	2.35				
3	$\frac{5}{8}$	36	12 $\frac{1}{2}$	9.00	3.00				

BROWN'S SNIP SHEARS
For Light Metal or Jewelers' Work
**No. 1588 POLISHED**

Length, inches	Price, Each	Price per Dozen	Length, inches	Price Each	Price per Dozen
6	\$1.10	\$11.00	7	\$1.25	\$12.80
6 $\frac{1}{2}$	1.20	11.80	8	1.50	15.00

TINNERS' SNIPS

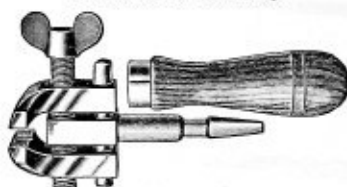
Forged from Solid Steel; Black Japanned Handles; Laid Edges; Fully Warranted

**Straight Blade****Curved Blade**

No.	Length, inches	Cuts, inches	Price per Pair	No.	Length, inches	Cuts, inches	Price per Pair
12	9	1 $\frac{1}{2}$	\$1.00	10CB	11	2 $\frac{1}{2}$	\$2.25
11	10	2	1.25	9CB	12	3	2.50
10	11	2 $\frac{1}{2}$	1.40	8CB	13	3 $\frac{1}{2}$	3.00
9	12	3	1.50	7CB	14	4	3.50
8	13	3 $\frac{1}{2}$	2.00	6 $\frac{1}{2}$ CB	15 $\frac{1}{2}$	4 $\frac{1}{2}$	4.25
7	14	4	2.50				
6 $\frac{1}{2}$	15 $\frac{1}{2}$	4 $\frac{1}{2}$	3.00				

HAND VISES

STANDARD No. 549



Drop forged, tempered steel jaws finished black and bright. Handles on bright finish cocobolo or black cherry.

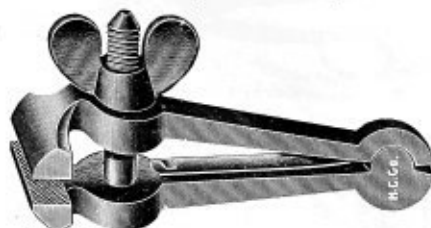
Width of Jaws, inches	Jaws Open, inches	Weight ounces	PRICES EACH	
			Black	Bright
1 1/4	1 1/4	14	\$1.25	\$1.50
1 1/2	1 1/2	18	1.50	1.75

ALFORD No. 1



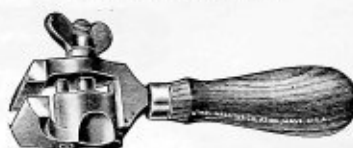
Drop forged, tempered jaws, hollow cocobolo handle for holding bit shank and tools. Can be used with bit brace or handle can be screwed into it at right angles. Price includes tools.

Width Jaws, inches	Jaws Open, inches	Each Complete
1 1/4	1 3/8	\$2.10

SPRING HAND VISES
With Bright Steel Jaws

Length, inches.....	3	4	5	6
Per Dozen.....	\$6.00	\$6.00	\$8.20	\$12.00
Each.....	.60	.60	.80	1.20

THE BOSS No. 540



All steel (except handle), hardened throughout, finely finished with polished jaws.

Width of Jaws, inches	Jaws Open, inches	Weight, lbs.	Price
1 1/4	3/4	1/2	\$0.75
1 1/2	1	3/4	1.00

IMPROVED HAND VISE
Nickel Plated

For holding wire there is a hole through the handle and screw. Weight, 8 ounces.



Price, Each.....\$1.75

JEWELER'S PIN VISE
Nickel Plated

The screw is large, cleanly cut and covered from dirt.



Prices

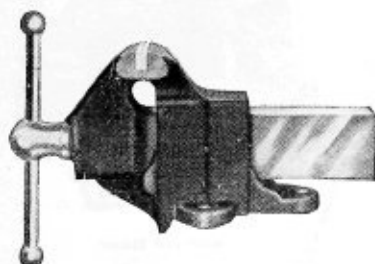
Regular size.....	Each, \$1.50	Per Dozen, \$15.00
Small size.....	" 1.20	" " 12.00

PEERLESS PIPE GRIPS
For Any Make of Vise

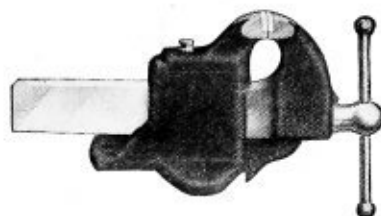
No.	For Vise Suitable	For Pipe inches	Price per Pair
1	With 3 to 4 1/2 Jaws	1/4 to 2 1/2	\$2.50
2	" 4 3/4 to 5 1/2 "	1/4 to 5	2.75
3	" 6 to 8 1/2 "	1/4 to 6	3.00

"BULLOCK" BENCH AND MACHINISTS' VISES

"Bullock" Vises are made of semi-steel castings. The screw, knob, head, and handle are of cold rolled steel, jaws are faced with highest grade crucible tool steel. The design is perfect and the workmanship and material strictly first-class throughout. They are sold under our own brand, and every "Bullock" vise is fully warranted.



With Solid, Stationary Jaws



With Self-Adjusting Swivel Jaws

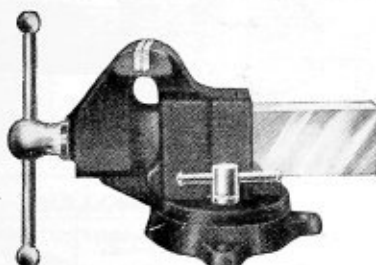
STATIONARY BASE

STATIONARY JAWS

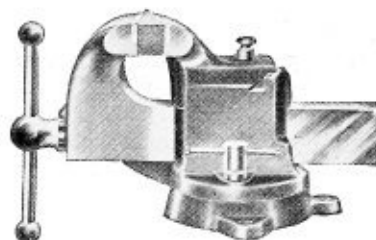
No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each
90	2½	2½	17	\$ 5.00
91	3	4	22	6.00
92	3½	5	28	7.00
93	4	6	42	8.50
94	4½	6½	54	10.00
95	5	7½	75	13.00
96	5½	8½	101	18.50
97	6	10	135	25.00
98	7	12	210	30.00

SWIVEL JAWS

No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each
81	3½	5	37	\$ 8.50
82	4	6½	53	11.00
83	4½	7½	70	13.00
84	5¼	8½	117	19.50
85	6	11	160	28.00



With Solid, Stationary Jaws



With Self-Adjusting Swivel Jaws

SWIVEL BASE

STATIONARY JAWS

No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each
70	2½	2½	20	\$ 5.50
71	3	4	28	7.50
72	3½	5	38	8.75
73	4	6	54	10.50
74	4½	6½	65	12.50
75	5	7½	90	16.00
76	5½	8½	120	22.00
77	6	10	156	30.00
78	7	12	240	40.00

SWIVEL JAWS

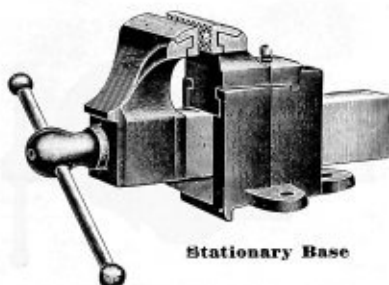
No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each
50	3½	5	37	\$ 8.75
51	4	6½	53	10.50
52	4½	7	70	12.50
53	5	7½	85	16.00
54	5½	8½	125	22.00
55	6	11	158	27.00
56	7	12	220	35.00

H.Channon Company. Chicago.

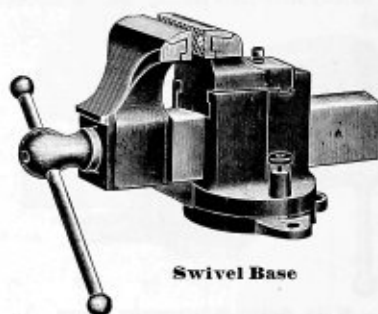
IMPROVED PRENTISS' PATENT VISES

With Self-Adjusting Jaws Fitted With Replaceable Jaw Faces

The quality, workmanship and design of Prentiss' vises are strictly first class in every particular. One of the latest improvements in their manufacture is the replaceable Jaw Faces, the advantages of which will be readily appreciated.



Stationary Base

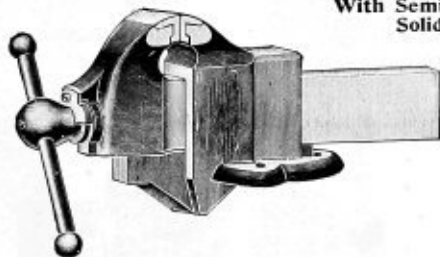


Swivel Base

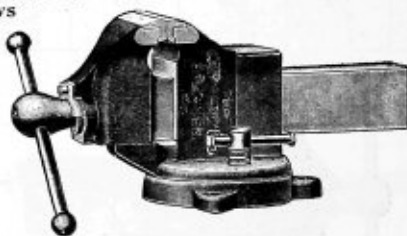
No.	Width Jaw, inches	Opens, inches	Weight, pounds	Price Each	No.	Width Jaw, inches	Opens, inches	Weight, pounds	Price Each
1	2 $\frac{5}{8}$	3 $\frac{1}{2}$	13 $\frac{1}{2}$	\$ 5.50	18	2 $\frac{5}{8}$	3 $\frac{1}{2}$	17	\$ 6.75
2	3 $\frac{1}{2}$	4 $\frac{1}{4}$	28	7.00	19	3 $\frac{1}{2}$	4 $\frac{1}{4}$	32	8.50
2 $\frac{1}{2}$	4	5 $\frac{1}{4}$	41	9.00	19 $\frac{1}{2}$	4	5 $\frac{1}{4}$	46	10.50
3	4 $\frac{1}{2}$	6	54	10.50	20	4 $\frac{1}{2}$	6	65	12.50
4	5 $\frac{1}{4}$	8	96	17.00	21	5 $\frac{1}{4}$	8	109	19.00
5	6	9	146	24.00	22	6	9	168	27.00
6	7	11	184	30.00	23	7	11	207	35.00

PARKER'S PATENT VISES

With Semi-Steel, Reinforced Solid Slide Jaws



Stationary Base

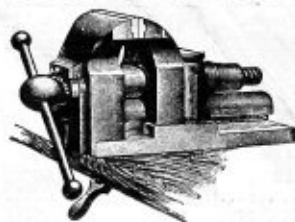


Swivel Base

No.	Opens, inches	Jaws, inches	Weight, pounds	Price Each	No.	Opens, inches	Jaws, inches	Weight, pounds	Price Each
29	4	3 $\frac{1}{4}$	31	\$ 6.25	229	4	3 $\frac{1}{4}$	36	\$ 7.00
39	6 $\frac{1}{4}$	3 $\frac{3}{4}$	47	7.00	239	6 $\frac{1}{4}$	3 $\frac{3}{4}$	54	8.75
49	7	4 $\frac{1}{4}$	66	9.00	249	7	4 $\frac{1}{4}$	75	11.00
59	8	4 $\frac{3}{4}$	81	11.75	259	8	4 $\frac{3}{4}$	95	14.50
69	9	5 $\frac{1}{4}$	123	16.25	269	9	5 $\frac{1}{4}$	143	20.50
79	9 $\frac{1}{2}$	6 $\frac{1}{4}$	150	24.00	279	9 $\frac{1}{2}$	6 $\frac{1}{4}$	185	30.00

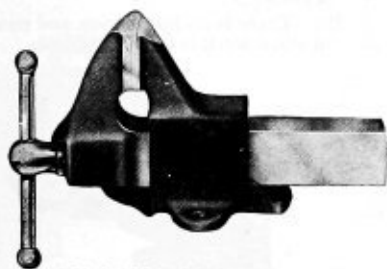
PARKER'S HEAVY FILING OR CHIPPING VISES

Made exceptionally strong and heavy to allow chipping or filing without danger of breaking vise. Steel faces of jaws are milled and fitted to same and are renewable.

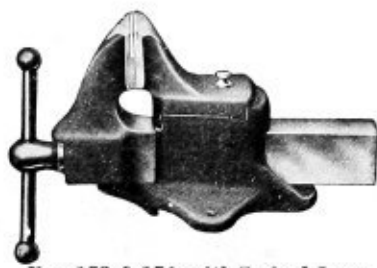


No.	Weight, pounds	Jaw, inches	Opens, inches	Price Each
65	80	5	6	\$16.00
66	100	6	7	24.00

WOODWORKERS' VISES



Nos. 151 & 152, with Stationary Jaws

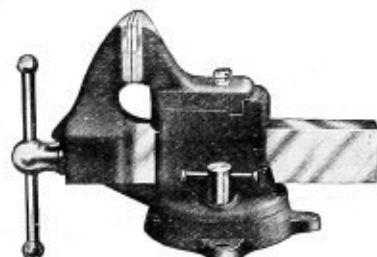


Nos. 153 & 154, with Swivel Jaws

STATIONARY BASE



Nos. 155 & 156, with Stationary Jaws



Nos. 157 & 158, with Swivel Jaws

SWIVEL BASE

Number	Width Jaws, inches	Jaws Open, inches	Weight, pounds	Price, Each
151	4	7	46	\$ 8.50
152	4½	11	60	10.50
153	4	7	50	9.00
154	4½	11	66	11.00
155	4	7	52	10.50
156	4½	11	66	12.50
157	4	7	62	10.50
158	4½	11	76	12.50

BULLOCK OVAL SLIDE VISE

A superior vise for this style. Has tool steel jaws.



Number	Size, inches	Opens, inches	Weight, pounds	Price Each
361	2½	3¾	8	\$2.50
362	3	4	14	3.00
363	3½	4½	22	4.75
364	4	4½	30	6.50

QUICK ACTING WOOD WORKER'S VISE

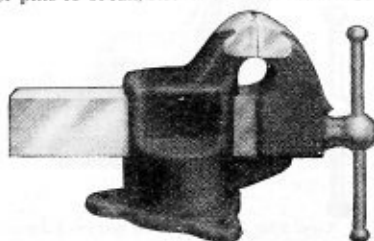
Very simple, with few parts.



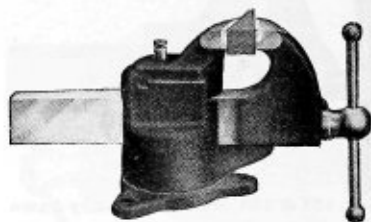
No.	Jaws, inches	Opening, inches	Weight, pounds	Price, Each
70	7 x 4	9	26	\$5.50
80	10 x 5	12	35	6.50

AUTOMATIC SWIVEL VISES

When work is fastened in the jaws rotation is stopped automatically. There is no lost motion, and no screws, levers or pins to break, stick or wear. Will not slip a fraction of an inch when work is tightly gripped.



With Solid Jaws

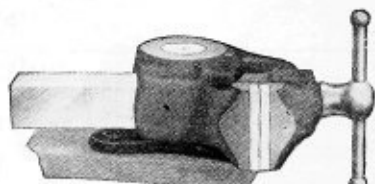


With Swivel Jaws

No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each	No.	Width Jaw, inches	Opens, inches	Weight, lbs.	Price Each
1	1½	2	3	\$ 6.00	20	3½	5	44	\$13.00
2	2½	2½	11	7.50	21	4	6	66	16.00
3	3	4	20	9.50	22	4½	8	85	19.80
4	3½	5	33	11.00	23	5¼	9	135	28.80
5	4	6	57	13.50	24	6	11	160	38.00
6	4½	8	75	16.50	25	7	12	238	54.00
7	5¼	9	122	24.00					
8	6	11	140	36.00					
9	7	12	224	45.00					

UNIVERSAL AUTOMATIC SWIVEL VISES

Body can be lifted from base and placed so that jaws are vertical (as shown in cuts). Locks automatically when jaws are tightened.



No.	Width Jaws, inches	Opens, inches	Weight, lbs.	Price, Each	No.	Width Jaws, inches	Opens, inches	Weight, lbs.	Price, Each
40	1½	2	3	\$7.00	42	3	4	23	\$10.50
41	2½	2½	11	8.50	43	3½	5	38	12.75



NEW SHEPARD VISE

For Small Work

Stationary bottom. Wrought steel sliding bars, screws, levers and jaws. Hand-somely polished anvil.

No.	Jaws, inches	Opens, inches	Weight, lbs.	Price Each
152	1½	1½	1½	\$0.60
153	1¾	1¾	2½	1.20
154	2	2	3	1.50



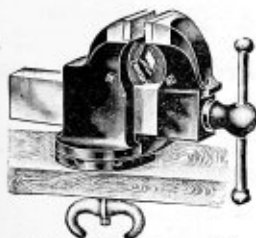
DIAMOND VISES

Made in three patterns, (1) Plain, (2) Clamp and (3) Swivel.

No.	Jaws, inches	Opens, inches	Price Each
1	2½	3	\$2.00
2	2½	3	2.40
3	2½	3	2.60

Pipe Jaws\$0.35

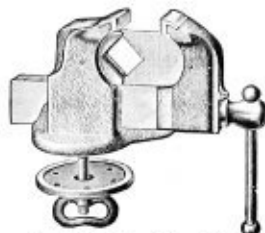
COMBINATION PIPE VISES



Prentiss' "Monarch"



Parker's Patent



Smith's Combination

PRENTISS' "MONARCH" VISE WITH SWIVEL BASE AND REVERSIBLE PIPE JAWS

No.	Jaws, inches	Holds Pipe, inches	Weight, lbs.	Price Each
401.....	3½	⅝ to 2½	44	\$16.00
402.....	4½	⅝ to 3	65	20.00
403.....	5	⅝ to 4	110	28.00

PARKER'S PATENT COMBINATION PIPE VISES WITH ROUND AND PIPERS JAWS

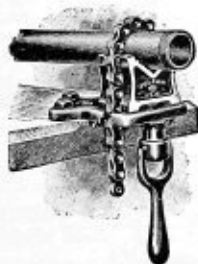
SWIVEL BASE					STATIONARY BASE		
No.	Jaws, inches	Weight, lbs.	Holds Pipe, inches	Price Each	No.	Weight, lbs.	Price Each
87	3½	41	2 and under	\$16.00			
88	4½	59	3 and under	20.00			
288½	4¾	105	4 and under	28.00	88½	94	\$28.00
289½	5½	155	6 and under	35.00	89½	141	35.00

SMITH'S COMBINATION PIPE VISE

No.	Weight, lbs.	Takes Pipe, inches	Price Complete, Each
1.....	47	⅝ to 2	\$16.00
2.....	70	⅝ to 3	20.00
3.....	100	⅝ to 4	28.00

"VULCAN" CHAIN PIPE VISE

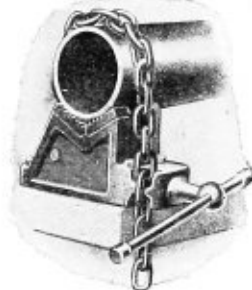
Size folded, 6x8x8 inches, weight 10 lbs. Light, strong, compact.



Holds Pipe	Vise Complete	Extra Parts						
		Base	Jaws, Pair	Chain	Handle	Screw	Nut	Washer
⅝ to 2½	\$5.00	\$1.00	\$2.25	\$1.25	.50	.20	.60	.20

ELLIS CHAIN PIPE VISE

Grips pipe perfectly without crushing it. Very strong and well made with a capacity for a wide range of sizes.



No.	0	1
Holds Pipe.....	⅝ to 6	⅝ to 12
Weight.....	28	55
Price Complete.....	\$9.00	\$20.00
Ex. V Jaws (1 ea.).....	.75	1.00
Flat Jaws (4 set).....	2.00	2.00

MALLEABLE HINGED PIPE VISE

Self-Locking Type

Body and Base are malleable; screw and handle are cold rolled steel. Jaws are of high grade crucible tool steel.



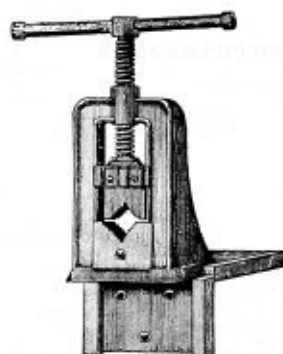
Number	For Pipe, inches	Weight	Price Each
0	$\frac{1}{8}$ to 2	12	\$ 3.00
1	$\frac{1}{8}$ to $2\frac{1}{2}$	17	4.00
2	$\frac{1}{4}$ to $3\frac{1}{2}$	34	7.00
3	$\frac{1}{2}$ to $4\frac{1}{2}$	25	10.00
4	2 to 6	60	20.00

Nos. 1, 2 and 3 have hook and pin. Nos. 0 and 4 have pin only.

ARMSTRONG PLAIN VISES

Made of best malleable iron with steel jaws and screw.

Cut shows angle plate which is furnished to fit either the No. 1 plain vise or the No. 1 with hinged vise.



Number	Pattern	Capacity	Weight, pounds	Price Each
1	Plain	$\frac{1}{8}$ to 2 in.	....	\$ 8.00
1H	Hinged	$\frac{1}{8}$ to $2\frac{1}{2}$ in.	16	10.00

Angle Plate, extra.....\$4.00

Extra Jaws, per set.....1.50

PRENTISS' 20th CENTURY PIPE VISE

A very strong, convenient and durable vise which can be used on bench or post, in any position. Material, workmanship and finish is strictly first class.



Number	Holes Pipe, inches	Weight, lbs.	Price Each
285	$\frac{1}{8}$ to 2	8	\$ 5.00
286	$\frac{1}{8}$ to 3	18	7.50
288	$\frac{1}{8}$ to 4	40	14.00

BLACKSMITHS' SOLID BOX VISES

Extra quality and finish, strictly high class in every respect.

Width Jaws, inches	Weight, lbs.	Price Each	Width Jaws, inches	Weight, lbs.	Price Each
4	40	\$10.50	$6\frac{1}{2}$	125	\$27.50
$4\frac{1}{2}$	50	11.50	7	150	36.00
5	65	14.00	$7\frac{1}{2}$	180	47.00
$5\frac{1}{2}$	80	17.50	8	200	56.00
6	100	22.00	....	....	....



THE PERFECT HANDLE SCREW DRIVER

A Solid, One Piece, Drop-Forging

The Oval Shaped Wood Handle gives greater leverage, fits the hand better and is more comfortable than fluted round handles and other shapes.

They are tempered very correctly, each one is carefully tested, and they are fully warranted.



Length Blade, inches	Diam., inches	PRICE		Length Blade, inches	Diam., inches	PRICE	
		Each	Dozen			Each	Dozen
4	3/8	\$0.40	\$4.25	8	3/8	\$0.80	\$ 8.00
5	3/8	.50	5.00	10	3/8	1.00	10.00
6	3/8	.60	6.00	12	3/8	1.20	12.00
7	3/8	.70	7.00				

THE "PERFECT HANDLE" MACHINISTS' OR HEAVY SERVICE SCREW DRIVER



Made in Two Sizes.

	Nos. 9 1/2	10 1/2
Length over all.....	9 1/2	10 1/2
Length of Blade.....	4 1/2	5
Size of Square.....	3/8	3/8
Width of Point.....	1/2	3/8
Thickness of Point.....	1/8	5/16
List price, per dozen.....	\$12.00	\$13.00
List price, each.....	1.20	1.30

CHAMPION SCREW DRIVERS

Forged From Toughest Steel



MACHINISTS

Length Blade, inches	PRICE		Length Blade, inches	PRICE	
	Each	Dozen		Each	Dozen
2 1/2	\$0.30	\$3.00	7	\$0.70	\$ 7.00
3	.35	3.50	8	.80	8.00
4	.40	4.25	9	.90	9.00
5	.50	5.00	10	1.00	10.00
6	.60	6.00	12	1.20	12.00

EXTRA HEAVY WITH DOUBLE GRIP HANDLES

Inches.....	12	15	18	24	30
Per dozen.....	\$14.00	\$16.00	\$18.00	\$24.00	\$30.00
Each.....	1.40	1.60	1.80	2.40	3.00

CHAMPION CABINET

Light Handles. Slender Blades

Length Blade, inches	PRICE		Length Blade, inches	PRICE	
	Each	Dozen		Each	Dozen
2 1/2	\$0.30	\$3.00	6 1/2	\$0.65	\$ 6.50
3	.35	3.50	8 1/2	.80	8.00
4	.45	4.50	10 1/2	.95	9.50
5 1/2	.55	5.50	12 1/2	1.00	11.00

HELMER SCREW DRIVER

Cast Steel Blade. Steel Ferrule



Length Blade, inches	PRICE		Length Blade, inches	PRICE	
	Each	Dozen		Each	Dozen
4	\$0.20	\$2.00	7	\$0.26	\$2.60
5	.22	2.20	8	.28	2.80
6	.24	2.40			

VAN KLEECK SCREW DRIVER



Flemished oak finished handle. Best quality oil tempered crucible steel blade. Guaranteed not to turn in the handle.

List prices same as Champion.

"YANKEE" RATCHET SCREW DRIVER No. 11

Right and Left Hand and Rigid



Length Blade, inches	PRICE		Length Blade, inches	PRICE	
	Each	Dozen		Each	Dozen
2	\$0.40	\$4.40	6	\$0.75	\$ 7.80
3	.55	5.60	8	.90	9.00
4	.60	6.10	10	1.05	10.50
5	.65	6.60	12	1.15	11.60

"YANKEE" No. 12 RATCHET SCREW DRIVER

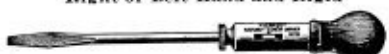
This is the same tool as the 6 inch, No. 11, "Yankee" Ratchet Screw Driver, except that the blade is only 1 1/2 inches long, and is made for special use of gunsmiths, fitters, electricians and mechanics requiring a strong, substantial screw driver with a short stub blade.

Made in one size only: Blade 5/8 inch diameter, 1 1/2 inches long, entire length of Screw Driver 5 3/4 inches.

Price per dozen.....	\$7.50
Price each.....	.75

"YANKEE" RATCHET SCREW DRIVER No. 15

Right or Left Hand and Rigid



A light blade Screw Driver for small screws in electric work, etc. It has on its blade a knurled washer, as shown in cut, and by means of this the blade can be turned with a finger and the thumb.

Length blade, inches.....	2	3	4	5
Price per dozen.....	\$4.90	\$5.30	\$5.70	\$6.10
Price each.....	.45	.50	.55	.60

"YANKEE" No. 20 SPIRAL RATCHET SCREW DRIVER

This tool is made for a special class of work, where the driving of screws is the only requirement.



Made in Size No. 1. Extreme length extended, including bit, 14 inches. Stroke 4 inches. Price each.....\$ 1.50
Price per dozen..... 14.75

No. 2. Length 17 inches; stroke 5 inches. Price each.....\$ 1.70

Price per dozen..... 17.00

No. 3. Length 19 inches; stroke 6 inches. Price each.....\$ 1.90

Price per dozen..... 19.00

"YANKEE" SPIRAL RATCHET SCREW DRIVER No. 30

Right and Left Hand and Rigid



Three bits are included with each tool.
The extreme length of tool with bit in chuck is 13 1/2 inches when closed, and 19 1/2 inches when extended. Price each.....\$1.75

MACHINISTS' HAMMERS



Number	Weight Each	Price Each	Price per Dozen
5-0	4 oz.	\$1.20	\$12.00
4-0	6 oz.	1.20	12.00
3-0	8 oz.	1.20	12.00
00	12 oz.	1.20	12.00
0	1 lb.	1.25	12.50
1	1 lb., 4 oz.	1.35	13.50
2	1 lb., 8 oz.	1.45	14.50
3	1 lb., 12 oz.	1.55	15.50
4	2 lbs.	1.65	16.50
5	2 lbs., 4 oz.	1.75	17.50
6	2 lbs., 8 oz.	1.90	19.00
7	2 lbs., 12 oz.	2.05	20.50
8	3 lbs.	2.20	22.00
9	3 lbs., 8 oz.	2.40	24.00

Machinists' Straight Pein and Cross Pein Hammers, Same List as Above

NAIL HAMMERS

Made of solid steel, polished with adze eye and plain or bell face, as desired.



No.	Weight Each	Price Each	Price per Doz
0	1 lb., 12 oz.	\$1.25	\$12.50
1	1 lb., 4 oz.	.90	9.00
1½	1 lb.	.85	8.50
2	13 oz.	.80	8.00
3	7 oz.	.75	7.50

BLACKSMITHS' HAND HAMMERS



No.	Weight Each	Price Each	Price per Dozen
0	1 lb., 10 oz.	\$1.30	\$13.00
1	2 lbs.	1.40	14.00
2	2 lbs., 10 oz.	1.50	15.00
3	3 lbs.	1.60	16.00
4	3 lbs., 8 oz.	1.70	17.00
5	4 lbs., 8 oz.	1.90	19.00

ENGINEERS' HAMMERS

Face and Pein



Face and Pein

No.	Weight Each	Price Each	Price per Dozen
0	1 lb., 2 oz.	\$1.20	\$12.00
1	1 lb., 10 oz.	1.30	13.00
2	2 lbs.	1.40	14.00
3	2 lbs., 8 oz.	1.50	15.00
4	3 lbs.	1.60	16.00
5	3 lbs., 8 oz.	1.70	17.00
6	4 lbs., 8 oz.	1.90	19.00

Double Face



Double Face

No.	Weight Each	Price Each	Price per Dozen
1	1 lb., 8 oz.	\$1.45	\$14.50
2	2 lbs., 6 oz.	1.65	16.50
3	3 lbs.	1.80	18.00
4	3 lbs., 10 oz.	1.95	19.50

RIVETING HAMMERS

Plain Eye



No.	Weight Each	Price Each	Price per Dozen
0	4 oz.	\$0.55	\$5.50
1	7 oz.	.55	5.75
2	9 oz.	.60	6.00
3	12 oz.	.60	6.25
4	15 oz.	.65	6.50
5	1 lb., 2 oz.	.70	7.00
6	1 lb., 6 oz.	.75	7.50
7	1 lb., 10 oz.	.80	8.00

CHIPPING HAMMERS



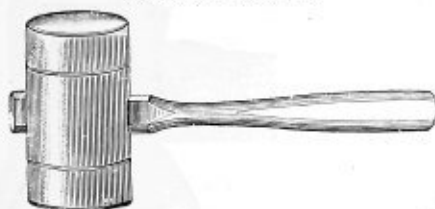
No.	Price Each	Price per Dozen	Weight Each
0	\$1.30	\$13.00	1 lb., 4 oz.
1	1.35	13.50	1 lb., 8 oz.
2	1.45	14.50	2 lbs.
3	1.55	15.50	2 lbs., 8 oz.
4	1.65	16.50	2 lbs., 14 oz.

BRICKLAYERS' HAMMERS



No.	Weight Without Handle	Price per Dozen	Adze Eye
		Plain Eye	
1	1 lb., 2 oz.	\$11.00	\$13.00
2	1 lb., 8 oz.	12.00	14.00
3	2 lbs.	13.00	15.00
4	2 lbs., 8 oz.	14.00	16.00

MAULS AND MALLETS

MALLET
Mortised Handles

HICKORY

No.	Length, inches	Diameter Face, inches	Price	
			Each	Dozen
1	5	3	\$0.15	\$1.50
2	5½	3½	.20	2.00
3	6	4	.25	2.50

LIGNUMVITAE

No.	Length, inches	Diameter Face, inches	Price	
			Each	Dozen
5	5	3	\$0.30	\$3.00
6	5½	3½	.40	4.00
7	6	4	.50	5.00

TINNERS' MALLET



No. 4. Round Hickory, 5½ inches long, in either 2¼ in. or 2½ in. diameter.

Price.....per dozen, \$1.00

RUBBER MALLET



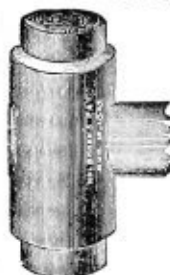
No.	Length of Head, inches	Diameter at Center, inches	Diameter at Ends, inches	Price	
				Each	Dozen
1	3½	2½	2¼	\$1.20	\$12.00
2	3½	2½	2¼	1.50	15.00
3	4	2½	2¼	1.80	18.00
4	4½	3	2½	2.55	25.50

COPPER HAMMERS
Handles Extra

Weight, pounds....	½	1	1½	2
Per pound.....	\$0.60	.57	.57	.55
Weight, pounds.....	2½	3	4	
Per pound.....	\$0.55	.53	.53	

Larger sizes at corresponding list prices.

HIDE FACED HAMMERS



These Hammers are invaluable for machinists, workers in brass or silver, jewelry manufacturers, or for any one who needs to strike a hard blow without bruising the material he is at work upon.

When worn out, the faces can be renewed at slight cost, the old ones being easily removed.

No.	Weight pounds	Diam. Face, inches	Prices		EXTRA FACES	
			Each	Dozen	Each Pair	Doz. Pairs
1	1	1¼	\$1.05	\$10.50	\$0.30	\$2.90
2	1½	1½	1.30	13.30	.35	3.60
3	2	1¾	1.60	15.90	.45	4.50
4	4	2	2.30	23.00	.60	6.25
5	5½	2¾	3.30	33.00	.90	9.00

RAWHIDE MALLET



These are light Mallets, made entirely of hide (except the handle), and suited to a variety of uses.

No.	Diameter, inches	Length, inches	Weight, ounces	Prices	
				Each	Dozen
0	1	2½	1½	\$0.36	\$ 3.60
1	1¼	2¾	3½	.45	4.50
2	1½	3	6	.55	5.40
3	1¾	3½	7½	.60	6.25
4	2	3¾	10	.80	8.00
5	2¾	4¾	21	1.75	17.75
6	2¾	4¾	23	2.25	22.20

RAWHIDE MAULS

We can renew the hide part of these Mauls when it is worn out, and when thus refilled the Maul is as good as new.



No.	Weight, lbs.	Price Each
1	3	\$1.50
2	4	1.75
3	6	2.00
4	8	2.25
5	10	2.50
6	12	2.75

MAULS FOR SEWER BUILDERS, GAS WORKS, ETC.

With Selected Hickory Handles, Head Iron Bound



Size....inches,	6x8	6x9	7x9	7x10	8x10
Price....each,	\$3.50	3.50	3.75	4.00	4.25

USONA HATCHETS

USONA HATCHETS Are Made of Finest Quality Forged Steel, with Tempered Bit and Ebony Finish



Claw

Shingling
Claw HatchetsBroad or Bench
Western Pattern

Number	Width Cut, inches	Price Each	Price per Dozen
2	3 $\frac{7}{8}$	\$0.95	\$ 9.50
3	4 $\frac{3}{8}$	1.00	10.00

Shingling Hatchets

Number	Width Cut, inches	Price Each	Price per Dozen
2	3 $\frac{7}{8}$	\$0.85	\$8.50
3	4 $\frac{3}{8}$	.90	9.00

*Broad or Bench Hatchets

Number	Width Cut, inches	Price Each	Price per Dozen
3	5	\$1.30	\$13.00
4	5 $\frac{1}{2}$	1.45	14.50
5	6	1.65	16.50
6	6 $\frac{1}{2}$	1.80	18.00

*USONA BROAD HATCHETS are made composite, with LAID CRUCIBLE TOOL STEEL, BITS. They are fully warranted for the hardest service.

HUNTERS' HATCHETS OR AXES



No.	Weight Each, pounds	Length Handle, inches	Price per Dozen
0	1	13	\$ 9.00
1	1 $\frac{1}{2}$	14	10.00
2	1 $\frac{3}{4}$	16	11.00

GERMANTOWN HALF HATCHETS
With Scored Heads

Standard carbuilders' pattern, olive bronze finish, forged from one piece best crucible tool steel.



No.	Size	Width Cut, inches	Each	Per Doz.
318	2	3 $\frac{1}{2}$	\$1.10	\$11.00
318 $\frac{1}{2}$	3	3 $\frac{3}{4}$	1.15	11.50

AXES



"Michigan" Pattern,
Single Bitted
"Boughton" Quality

"BOUGHTON"

Composite; laid crucible tool steel bit; hand forged and tempered. Bronze finish with polished bits. The best axe made. Fully warranted.



"Michigan" Pattern,
Double Bitted
"Boughton" Quality
"Boughton"

"USONA"

Fine quality solid forged steel with tempered bits; solid ebony finish. Strictly serviceable. Fully warranted.



"Michigan" Pattern,
Single Bitted
"Usona" Quality

Style	Pattern	Weight	Each	Dozen
Single bitted	Michigan	3½ to 4½ lbs.	\$1.20	\$12.00
" "	"	4 " 5 "	1.50	15.00
" "	"	5 " 6 "	1.80	18.00
Double "	"	4 " 5 "	1.70	17.00

"Usona"

Style	Pattern	Weight	Each	Dozen
Single bitted	Michigan	4 to 5 lbs.	\$1.00	\$10.00

Handles for above axes listed elsewhere in this book.

HANDLED AXES

All Handled and Complete, Packed ½ Dozen in Open Case or Crate. Assorted Standard Weights



"Boughton" (same as above) with extra grade handles:	Each	Dozen
Single bitted; Michigan pattern, 4 to 5 lbs.	\$1.80	\$18.00
" " " " 5 to 6 "	2.10	21.00
Double " " " 4 to 5 "	2.00	20.00
"Usona" (same as above) with No. 1 grade handles:		
Single bitted, Michigan pattern, 4 to 5 lbs.	1.30	13.00

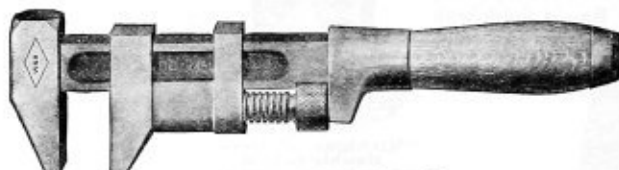
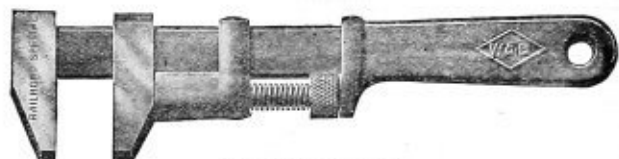
FIREMEN'S HANDLED AXES

To Underwriters' Specifications. Handles Painted Red



"Sterling" Firemen's Axes: 5 inch cut.	Dozen, \$30.00
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W. & B. WRENCHES

**Machinists' Knife Handle****Regular or Agricultural****Railroad Special****Machinists' Steel Handle**

The Machinists' Knife Handle Wrench. This wrench has the head and bar drop-forged in one piece from selected steel. Bar is extra heavy and entire wrench is practically indestructible. Jaws are case-hardened and the entire wrench is ground and polished, with fine black finish.

Regular or Agricultural Wrench. This wrench is the same in construction and finish as the Machinists' wrench, except that it has lighter bar and regular handle instead of knife handle.

The Railroad Special Wrench. This wrench has the same construction and finish as the Machinists' knife handle, except it has a steel handle.

The Machinists' Steel Handle Wrench. This is a semi-finished wrench, strictly first-class and warranted for hard service. Head and jaws are drop-forged from selected steel and jaws are hardened. With exception of finish, this wrench is in every way equal to the best wrench made.

**List Applying to the Machinists' Knife-Handle
Machinists' Steel Handle and Railroad Special
Wrench.**

Length, inches	Price Each	Price per Dozen
6	\$0.90	\$ 9.00
8	1.00	10.00
10	1.20	12.00
12	1.40	14.00
15	2.40	24.00
18	3.00	30.00
21	3.60	36.00

**List Applying to Agricultural
and Regular Wrench.**

Length, inches	Will Open, inches	Weight Each, lbs.	Price Each	Price per Dozen
6	1	$\frac{2}{3}$	\$1.00	\$10.00
8	$1\frac{1}{4}$	$1\frac{1}{4}$	1.20	12.00
10	$1\frac{3}{8}$	$1\frac{3}{8}$	1.40	14.00
12	2	$2\frac{1}{2}$	1.70	17.00
15	$2\frac{3}{8}$	$3\frac{1}{4}$	2.40	24.00

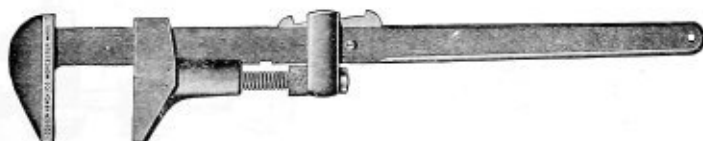
COE'S WRENCHES



Knife-Handle



Steel Handle



New Key Model

COE'S KNIFE-HANDLE AND STEEL HANDLE WRENCHES

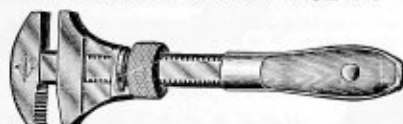
Length, inches	Price, Each	Price, per Dozen
6	\$0.90	\$ 9.00
8	1.00	10.00
10	1.20	12.00
12	1.40	14.00
15	2.40	24.00
18	3.00	30.00
21	3.60	36.00

COE'S NEW KEY MODEL WRENCHES

Length, inches	Will Open, inches	Weight, Each, lbs.	Price, Each
28	5 1/4	17	\$ 9.75
36	6 1/4	27	19.00
48	9 1/2	62	47.00

The 28-inch will take a 3-inch, the 36-inch a 4-inch and the 48-inch a 6-inch standard pipe union.

W. & B. COMBINATION WRENCH



Made of Crucible Steel, Bright Finish

Length, inches	Opens, inches	Weight Each, lbs.	Holds Pipe	Holds Round Iron	Price, per Dozen	Price, Each
10	2 1/4	2 1/2	1/8 to 3/4	1/4 to 1	\$25.25	\$2.50
12	2 3/8	3 1/2	3/8 to 1 1/2	1/2 to 1 3/4	28.50	2.85
15	3 1/8	5	3/8 to 2	1/2 to 2 1/4	40.50	4.05

PATENT LONG NUT COMBINATION WRENCHES



Bright Finish

Size, inches	For Pipe, inches	Wt. per Dozen, lbs.	Price, Each	Price, per Dozen
10	1/4 to 1	26	\$2.50	\$25.25
12	1/2 to 1 1/4	40	2.85	28.50
15	1/2 to 2 1/4	55	4.05	40.50
18	1/2 to 3	87	7.20	72.00

RATCHET WRENCHES

LOWELL REVERSIBLE RATCHET WRENCHES



Changeable to right or left hand motion at pleasure. Can be changed to a ratchet drill by removing cap and replacing gear by drill socket.

Price—including one gear only

No.	Lever, inches	Price Each
1	10	\$3.00
2	12	4.00
3	15	5.00
*3½	18	6.00
4	18	7.00

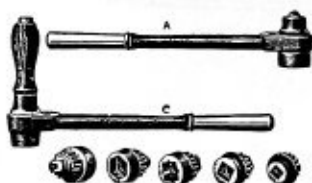
*This handle takes a No. 3 gear.

Price Wrench Gears

No.	Sq. opening	Hex. opening	Each
1	3/8, 1/2, 5/8	5/8, 3/4	\$0.50
2	1/2, 3/4, 5/8	3/4, 7/8, 1	.60
3	3/4, 7/8, 1, 1 1/8	1, 1 1/8, 1 1/4	.75
4	1 1/8, 1 1/4, 1 1/2, 1 3/4	1 1/4, 1 1/2, 1 3/4	1.00

When ordering state size and shape (sq. or hex.) hole wanted.

LOWELL LAG SCREW WRENCH



Easily changeable for various sizes by means of the different sockets. Will turn screws, nuts or bolts either way without taking off the wrench.

Price—including one socket only

No.	Length handle inches	Style handle	Capacity	Price Each	Extra sockets Each
1	12	A	1/4, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4 square	\$1.75	\$0.40
..	..	..	3/4, 7/8, 1, 1 1/8, 1 1/4, hex.	..	..
*1	12	C	3/4, 7/8, 1, 1 1/8, 1 1/4, hex.	2.00	.40
*2	16	A or C	1, 1 1/8, 1 1/4, 1 1/2	3.00	.75
*3	20	A or C	1 1/8, 1 1/4, 1 1/2, 1 3/4, 1 7/8	4.50	1.00

*For either square or hex. nuts.

No. B socket is only made to order.

BRIDGE BUILDERS' WRENCH



No.	Size lever, feet	Size sq. openings, inches	Size hex. openings, inches	Price Each	Extra gears Each
1	3	1 1/4, 1 1/2	1 1/4, 1 1/2, 1 3/4	\$ 8.00	\$1.00
2	3	1 1/2, 1 3/4, 2	1 3/4, 2, 2 1/4, 2 1/2	14.00	2.00
3	3 1/4	2, 2 1/4, 2 1/2, 2 3/4	2 1/4, 2 1/2, 2 3/4, 3	16.00	3.00

STEEL SOCKET BRIDGE WRENCH



Will turn nut either way without removing wrench. Made from carefully selected steel castings and warranted to give satisfaction.

Price—including one socket only

No.	Length handle feet	Will take sockets having openings size, inches	Wt. lbs.	Price Each	Extra sockets Each
1	2	1 1/4, 1 1/2, 1 3/4, 1 7/8, 2	10	\$ 6.00	\$1.00
2	3	2, 2 1/4, 2 1/2, 2 3/4, 2 7/8, 3 1/4	23	14.00	2.50
3	3	3 1/8, 3 1/2, 3 3/4, 4, 4 1/4, 4 1/2, 5	50	29.00	4.50

Capacities listed are either square or hex. nuts. Odd sizes made to order.

REVERSIBLE RATCHET WRENCHES

Little Giant

There are five different size handles.

Each handle holds a socket of each style.

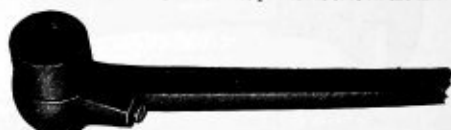


Reverse motion is obtained instantly by turning pawl from one side to the other. It is not necessary to remove wrench from work.

No.	Capacity	Length	Price Each complete
1	7/8 and 1	8	\$1.00
2	1 and 1 1/8	10	1.25
3	1 1/8 and 1 1/4	13	1.75
4	1 1/4 and 1 1/2	16	2.75
5	1 1/2 and 1 3/4	20 1/2	3.75
22	1 3/4 and 2	10	2.25
23	2 and 2 1/4	12	2.75
24	Square Shank Ratchet Drills	16	3.75
25	..	20 1/2	4.75
26	No. 1 Taper Shank Drills	10	2.50
27	No. 2 Taper Shank Drills	13	3.00
28	No. 3 Taper Shank Drills	16	4.00
29	No. 4 Taper Shank Drills	20 1/2	5.00

"GIANT" REVERSIBLE RATCHET WRENCH

For railroads, bridge builders, manufacturers and all users of socket wrenches. Web handles of drop-forged steel; sockets drifted from solid steel. The most powerful tool on the market.



All sockets take square or hexagon nuts. Made in 24-inch handle only and for the following size nuts: 3/4, 7/8, 1, 1 1/8 and 1 1/4 inches, standard bolt sizes. No. 324. Price—including any one-size socket.....\$8.00
Additional sockets.....Each 3.50

THE CHAMPION RATCHET WRENCH

Made from the finest grade of malleable iron with all parts broached to accurately fit together. Sockets fit all sizes of nuts, bolts, set screws, lag screws, etc.

Drill attachment makes a perfect working ratchet with socket taking standard, round or square shank drills.



- Fig. 1. Square sockets for nuts from $\frac{1}{4}$ inch to $\frac{3}{4}$ inch.
Fig. 2. Hexagon sockets for nuts from $\frac{1}{4}$ inch to $\frac{3}{4}$ inch.
Fig. 3. Extension of cold drawn steel tubing.
Fig. 4. Ratchet wrench.
Fig. 5. Drill attachment for $\frac{1}{2}$ inch, round shank drills.

Price, Set Complete, \$5.00

SOCKET WRENCHES



Malleable Iron

FOR SQUARE HEAD BOLTS

No.	inch hole for	inch set screw,	5 inches long,	Each
A	$\frac{1}{4}$	$\frac{1}{8}$	5	\$0.15
B	$\frac{3}{8}$	$\frac{3}{16}$	5	.15
C	$\frac{1}{2}$	$\frac{1}{4}$	5	.15
D	$\frac{3}{4}$	$\frac{3}{8}$	5	.15
1	$\frac{1}{4}$	$\frac{1}{8}$ in. Set Screw, Nut for $\frac{1}{8}$ in. Bolt,	8	.20
2	$\frac{3}{8}$	$\frac{3}{16}$ in. Set Screw, Nut for $\frac{3}{16}$ in. Bolt,	9	.25
3	$\frac{1}{2}$	$\frac{1}{4}$ in. Set Screw, Nut for $\frac{1}{4}$ in. Bolt,	9 $\frac{1}{2}$	.30
4	$\frac{3}{4}$	$\frac{3}{8}$ in. Set Screw, Nut for $\frac{3}{8}$ in. Bolt,	10 $\frac{1}{2}$	.40
5	1	1 in. Set Screw, Nut for 1 in. Bolt,	12	.50
6	1 $\frac{1}{4}$	1 $\frac{1}{4}$ in. Set Screw, Nut for 1 $\frac{1}{4}$ in. Bolt,	12	.55
7	1 $\frac{1}{2}$	1 $\frac{1}{2}$ in. Set Screw, Nut for 1 $\frac{1}{2}$ in. Bolt,	12	.60

FOR HEXAGON CAP SCREWS AND NUTS

10	$\frac{1}{4}$ inch hole for	$\frac{1}{8}$ in. Hexagon Cap, Nut for $\frac{1}{8}$ in. Bolt,	6 inches long	\$0.20
11	$\frac{3}{8}$	$\frac{3}{16}$ in. Hexagon Cap, Nut for $\frac{3}{16}$ in. Bolt,	6	.20
12	$\frac{1}{2}$	$\frac{1}{4}$ in. Hexagon Cap, Nut for $\frac{1}{4}$ in. Bolt,	8	.25
13	$\frac{3}{4}$	$\frac{3}{8}$ in. Hexagon Cap, Nut for $\frac{3}{8}$ in. Bolt,	9 $\frac{1}{2}$	.30
14	1	1 in. Hexagon Cap, Nut for 1 in. Bolt,	10	.35
15	1 $\frac{1}{4}$	1 $\frac{1}{4}$ in. Hexagon Cap, Nut for 1 $\frac{1}{4}$ in. Bolt,	12	.40
16	1 $\frac{1}{2}$	1 $\frac{1}{2}$ in. Hexagon Cap, Nut for 1 $\frac{1}{2}$ in. Bolt,	12	.50
17	1 $\frac{3}{4}$	1 $\frac{3}{4}$ in. Hexagon Cap, Nut for 1 $\frac{3}{4}$ in. Bolt,	12	.55
18	2	2 in. Hexagon Cap, Nut for 2 in. Bolt,	12	.60
19	2 $\frac{1}{2}$	2 $\frac{1}{2}$ in. Hexagon Cap, Nut for 2 $\frac{1}{2}$ in. Bolt,	12	.65

STANDARD BRACE WRENCHES

This wrench is made of the best malleable iron, japanned and polished. The round base allows it to turn in the smallest possible space.

Packed one set in a box.



FOR HEX. NUTS

Price, per set (1 each)	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{4}$, and 1 $\frac{1}{2}$	\$2.00
Price, per dozen, $\frac{1}{4}$ inch opening		2.00
" " " $\frac{3}{8}$ " "		2.00
" " " $\frac{1}{2}$ " "		2.50
" " " $\frac{3}{4}$ " "		3.00
" " " 1 " "		3.50
" " " 1 $\frac{1}{4}$ " "		4.50
" " " 1 $\frac{1}{2}$ " "		5.00

NOTE:—Size given is diameter of bolt.



FOR SQUARE NUTS

Per set (1 each)	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{4}$, and 1 $\frac{1}{2}$	\$2.25
Price, per dozen, $\frac{1}{4}$ inch opening		1.75
" " " $\frac{3}{8}$ " "		2.00
" " " $\frac{1}{2}$ " "		2.50
" " " $\frac{3}{4}$ " "		3.00
" " " 1 " "		3.50
" " " 1 $\frac{1}{4}$ " "		4.00
" " " 1 $\frac{1}{2}$ " "		4.50
" " " 2 " "		5.00

NOTE:—Size given is square of nut.

THE "W. & B." AUTO WRENCH DROP FORGED—CASE HARDENED



Length, inches	Price Each	Price per Dozen
10	\$1.50	\$15.00

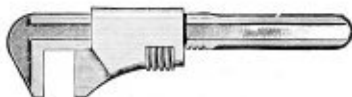
CHANNON'S ADJUSTABLE AUTO WRENCHES

Strictly first-class in every respect, drop-forged from selected high grade steel, malleable jaw, case hardened. A most substantial wrench for automobile motor boat, bicycle or general use.



Length, inches	Finish	Opens, inches	Each	Dozen
9½	Nickel	2½	\$1.45	\$14.40
9½	Mottled	2½	.85	8.40

BILLINGS ADJUSTABLE AUTOMOBILE WRENCHES

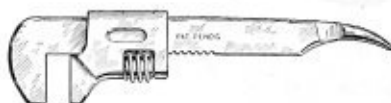


Size, inches	Open, inches	SEMI-FINISHED		FULL FINISHED	
		Each	Dozen	Each	Dozen
8	1½	\$1.00	\$10.00	\$1.20	\$12.00
10	2	1.00	10.00	1.20	12.00
14	2½	2.40	24.00	2.80	28.00
18	3	3.00	30.00	3.60	36.00

8-inch size is finished and nicked. All case hardened, drop forged.

COTTER PIN PULLER, SPREADER AND ADJUSTABLE WRENCH

An excellent tool for the automobile kit—saves weight, time and money. Made from selected steel, drop forged and hardened.



Length, inches	Finish	Opens, inches	Each	Dozen
7	Bright Nickel	1¾	\$0.50	\$6.00
7	Mottled	1¾	.45	5.40

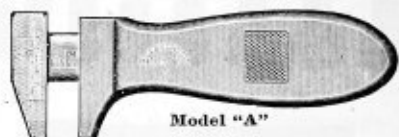
BILLINGS BICYCLE WRENCH



Without question, the highest grade and most satisfactory adjustable bicycle and pocket wrench on the market.

Weight, ounces	Opens, inches	Thickness of jaw, inches	Per Dozen, Nickel	Per Dozen, Black
5½	1¾	¼	\$7.00	\$6.00

BILLINGS POCKET WRENCHES



Model "A"



Model "B"

Drop Forged from Bar Steel, and finished in Black and Full Nickel Plated. Sliding Bar graduated to 32nds of an inch, with oval edges.

Model	Length, inches	Opens, inches	BLACK		NICKEL	
			Each	Dozen	Each	Dozen
A	4¼	1	\$0.90	\$ 9.00	\$1.00	\$10.00
B	5	1	.90	9.00	1.00	10.00
C	5	1	.90	9.00	1.00	10.00
D	6	1½	1.00	10.00	1.20	12.00
E	7	1¾	1.20	12.00	1.50	15.00

HEXAGON BOX WRENCHES 15° ANGLE, SINGLE HEAD

The small outside diameter of the head makes these wrenches efficient in corners and other places where the clearance is limited.



No.	For U.S. Stand- ard Nuts, Size Bolt, in	Extreme Length, inches	Outside Diam. Head, inches	PRICE EACH		
				Unfin- ished	Semi- Finished	Fin- ished
W-801	¼	4	1½	\$0.10	\$0.15	\$0.20
W-802	⅜	4½	1¾	.12	.18	.24
W-803	½	5½	1¾	.14	.21	.28
W-804	⅝	6½	1¾	.17	.25	.34
W-805	¾	7½	1¾	.20	.30	.40
W-806	⅞	8½	1¾	.25	.38	.50
W-807	1	9½	1¾	.32	.48	.64
W-808	1¼	11½	2	.40	.60	.80
W-809	1½	13½	2½	.50	.75	1.00
W-810	1¾	15	2½	.65	.98	1.30
W-811	1¾	17	2½	.85	1.28	1.70
W-812	1¾	19	3¼	1.10	1.65	2.20
W-813	1¾	21	3¼	1.40	2.10	2.80
W-814	1¾	23	3¼	1.75	2.63	3.50
W-815	1¾	25	4	2.10	3.15	4.20
W-816	1¾	27	4½	2.60	3.75	5.00

DROP FORGED STEEL WRENCHES

All drop forged steel wrenches will be furnished in the following conditions:
"UNFINISHED" Plain forging, not hardened, with openings either milled or unmilled. Milled openings sent unless otherwise ordered.

"SEMI-FINISHED" Edges ground, case hardened, heads bright, openings milled.

"FINISHED" Openings milled, ground, polished, case hardened, lacquered, with heads finished bright.

ENGINEERS' WRENCHES Single-Head



No.	Size Bolts, U. S. St'd Nuts	Open- ings, inches	Ex- treme Length	Price, Un- finished	Price, Semi- finished	Price, Fin- ished
60	1/4	5/16	2 1/2	\$0.08	\$0.12	\$0.16
0	1/4	5/16	2 3/4	.09	.13	.18
1	1/4	5/16	2 7/8	.10	.15	.20
2	1/4	5/16	3 1/8	.12	.18	.24
3	1/4	5/16	3 1/4	.14	.21	.28
4	1/4	5/16	3 3/8	.17	.25	.34
5	1/4	5/16	3 1/2	.20	.30	.40
6	1/4	5/16	3 5/8	.26	.39	.52
7	1/4	5/16	3 3/4	.32	.48	.64
8	1/4	5/16	3 7/8	.42	.63	.84
9	1/4	5/16	4 1/8	.58	.87	1.16
10	1/4	5/16	4 1/4	.75	1.13	1.50
11	1/4	5/16	4 3/8	1.00	1.50	2.00
12	1/4	5/16	4 1/2	1.25	1.88	2.50
13	1/4	5/16	4 3/4	1.62	2.43	3.24
14	1/4	5/16	4 7/8	2.00	3.00	4.00
15	1/4	5/16	5 1/8	2.50	3.75	5.00
16	1/4	5/16	5 1/4	3.00	4.50	6.00
16 1/2	1/4	5/16	5 1/2	3.70	5.55	7.40
17	1/4	5/16	5 3/8	4.40	6.60	8.80
18	1/4	5/16	5 1/2	6.00	9.00	12.00
19	1/4	5/16	5 3/4	7.00	11.40	15.20
19 1/2	1/4	5/16	5 7/8	10.00	15.00	20.00
20	3/8	3/4	6 1/4	13.00	19.50	26.00
20A	3/8	3/4	6 1/2	16.00	24.00	32.00
20B	3/8	3/4	6 3/4	22.00	33.00	44.00
20C	3/8	3/4	6 1/2	25.00	36.00	47.00
20D	3/8	3/4	6 3/4	28.00	39.00	50.00
20E	3/8	3/4	6 1/2	40.00	60.00	80.00
20F	3/8	3/4	6 3/4	45.00	65.00	85.00

DOUBLE HEAD SET SCREW WRENCHES



No.	For Set Screws, Size	Extreme Length	Price, Un- finished	Price, Semi- finished	Price, Fin- ished
65	1/8 and 1/4	3 1/4	\$0.13	\$0.20	\$0.26
66	1/8 and 1/4	3 1/2	.13	.20	.26
67	1/8 and 1/4	3 3/4	.15	.23	.30
68	1/8 and 1/4	4	.15	.23	.30
69	1/8 and 1/4	5	.18	.27	.36
70	1/8 and 1/4	5	.18	.27	.36
71	1/8 and 1/4	5 1/2	.22	.33	.44
72	1/8 and 1/4	5 1/2	.22	.33	.44
73	1/8 and 1/4	5 3/4	.27	.41	.54
74	1/8 and 1/4	6 1/4	.27	.41	.54
75	1/8 and 1/4	6 1/2	.33	.50	.66
76	1/8 and 1/4	6 3/4	.33	.50	.66
77	1/8 and 1/4	6 1/2	.40	.60	.80
78	1/8 and 1/4	6 3/4	.40	.60	.80
79	1/8 and 1/4	7	.48	.72	.96
80	1/8 and 1/4	7	.48	.72	.96
81	1/8 and 1/4	7 1/2	.58	.87	1.16
82	1/8 and 1/4	7 1/2	.58	.87	1.16

Note:—The openings in the above wrenches will admit of finishing to a larger size than given in table.
 With special openings lots of 100 or more will be furnished at a regular price; in less quantities, at a slight advance.

ENGINEERS' WRENCHES Double-Head



No.	Size Bolts, U. S. St'd Nuts	Open- ings, inches	Ex- treme Length	Price, Un- finished	Price, Semi- finished	Price, Fin- ished
21	1/4	5/16	3 1/4	\$0.12	\$0.18	\$0.24
22	1/4	5/16	3 1/2	.13	.20	.26
23	1/4	5/16	3 3/4	.14	.21	.28
24	1/4	5/16	3 1/2	.16	.24	.32
25	1/4	5/16	3 3/4	.18	.27	.36
26	1/4	5/16	3 7/8	.20	.30	.40
27	1/4	5/16	3 1/2	.22	.33	.44
28	1/4	5/16	3 3/4	.24	.36	.48
29	1/4	5/16	3 7/8	.28	.42	.56
30	1/4	5/16	4 1/8	.30	.45	.60
31	1/4	5/16	4 1/4	.32	.48	.64
32	1/4	5/16	4 3/8	.36	.54	.72
33	1/4	5/16	4 1/2	.40	.60	.80
34	1/4	5/16	4 3/4	.44	.66	.88
35	1/4	5/16	4 7/8	.51	.77	1.02
36	1/4	5/16	5 1/8	.58	.88	1.16
37	1/4	5/16	5 1/4	.65	.98	1.30
38	1/4	5/16	5 1/2	.76	1.14	1.52
39	1/4	5/16	5 3/8	.88	1.32	1.76
40	1/4	5/16	5 1/2	1.00	1.50	2.00
41	1/4	5/16	5 3/4	1.18	1.77	2.36
42	1/4	5/16	5 7/8	1.36	2.04	2.72
43	1/4	5/16	6 1/4	1.55	2.33	3.10
44	1/4	5/16	6 1/2	1.80	2.70	3.60
45	1/4	5/16	6 3/4	2.05	3.08	4.10
46	1/4	5/16	6 1/2	2.30	3.45	4.60
47	1/4	5/16	6 3/4	2.65	3.98	5.30
48	1/4	5/16	6 1/2	3.00	4.50	6.00
49	1/4	5/16	6 3/4	3.25	4.88	6.50
50	1/4	5/16	6 1/2	3.80	5.70	7.60
51	1/4	5/16	6 3/4	4.25	6.38	8.50
52	1/4	5/16	6 1/2	4.70	7.05	9.40
53	1/4	5/16	6 3/4	5.20	7.80	10.40
54	1/4	5/16	6 1/2	5.70	8.55	11.40
55	1/4	5/16	6 3/4	6.50	9.75	13.00
56	1/4	5/16	6 1/2	8.20	12.30	16.40
57	1/4	5/16	6 3/4	10.25	15.38	20.50

SINGLE-HEAD SET SCREW WRENCHES



No.	For Set Screws, Size	Extreme Length	Price, Un- finished	Price, Semi- Finished	Price, Fin- ished
280	1/8	3	\$0.08	\$0.12	\$0.16
281	1/8	3 1/4	.10	.15	.20
282	1/8	3 1/2	.12	.18	.24
283	1/8	3 3/4	.15	.23	.30
284	1/8	4	.20	.30	.40
285	1/8	4 1/4	.25	.38	.50
286	1/8	4 1/2	.30	.45	.60
287	1/8	4 3/4	.35	.53	.70
288	1/8	5	.42	.63	.84
289	1/8	5 1/4	.50	.75	1.00
290	1/8	5 1/2	.60	.90	1.20

DROP FORGED STEEL WRENCHES

All Drop Forged Steel Wrenches will be furnished in the following conditions:

"UNFINISHED" Plain forging, not hardened, with openings either milled or unmilled. Milled openings sent unless otherwise ordered.**"SEMI-FINISHED"** Edges ground, case hardened, heads bright, openings milled.**"FINISHED"** Openings milled, ground, polished, case hardened, lacquered, with heads finished bright.

HEXAGON CAP-SCREW WRENCHES

Single Head



Number	For Screws Diameter, Inches	Openings Finished	Extreme Length	Thickness of Head	Price, Unfinished	Price, Semi- Finished	Price, Finished
700	$\frac{1}{8}$	$\frac{3}{16}$	$2\frac{1}{2}$	$\frac{1}{8}$	\$0.09	\$0.14	\$0.18
701	$\frac{1}{4}$	$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{4}$	.10	.15	.20
701a	$\frac{1}{4}$	$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{4}$	.10	.15	.20
702	$\frac{3}{8}$	$\frac{5}{8}$	$4\frac{1}{2}$	$\frac{3}{8}$	.12	.18	.24
703	$\frac{1}{2}$	$\frac{3}{4}$	$5\frac{1}{2}$	$\frac{1}{2}$	.14	.21	.28
704	$\frac{5}{8}$	$\frac{7}{8}$	$6\frac{1}{2}$	$\frac{5}{8}$	.17	.26	.34
705	$\frac{3}{4}$	1	$7\frac{1}{2}$	$\frac{3}{4}$	.20	.30	.40
705a	$\frac{3}{4}$	1	$7\frac{1}{2}$	$\frac{3}{4}$	.20	.30	.40
706	$\frac{7}{8}$	$1\frac{1}{8}$	$8\frac{1}{2}$	$\frac{7}{8}$	.26	.39	.52
707	1	$1\frac{1}{4}$	$9\frac{1}{2}$	1	.32	.48	.64
708	$1\frac{1}{8}$	$1\frac{1}{2}$	$11\frac{1}{2}$	$1\frac{1}{8}$	.42	.63	.84

HEXAGON CAP-SCREW WRENCHES

Double Head



Number	For Screws Diameter, Inches	Openings Finished	Extreme Length	Thickness of Head	Price, Unfinished	Price, Semi- Finished	Price, Finished
723	$\frac{1}{8}$	$\frac{3}{16}$	4	$\frac{1}{8}$	\$0.13	\$0.20	\$0.26
723a	$\frac{1}{8}$	$\frac{3}{16}$	4	$\frac{1}{8}$	.13	.20	.26
724	$\frac{1}{4}$	$\frac{1}{2}$	$4\frac{1}{2}$	$\frac{1}{4}$	.16	.24	.32
725	$\frac{3}{8}$	$\frac{5}{8}$	$5\frac{1}{2}$	$\frac{3}{8}$	.18	.27	.36
725a	$\frac{3}{8}$	$\frac{5}{8}$	$5\frac{1}{2}$	$\frac{3}{8}$	.18	.27	.36
725b	$\frac{3}{8}$	$\frac{5}{8}$	$5\frac{1}{2}$	$\frac{3}{8}$	.18	.27	.36
726	$\frac{1}{2}$	$\frac{3}{4}$	$6\frac{1}{2}$	$\frac{1}{2}$	.20	.30	.40
727	$\frac{5}{8}$	$\frac{7}{8}$	$7\frac{1}{2}$	$\frac{5}{8}$	.22	.33	.44
728	$\frac{3}{4}$	1	$8\frac{1}{2}$	$\frac{3}{4}$	.24	.36	.48
729	$\frac{7}{8}$	$1\frac{1}{8}$	$9\frac{1}{2}$	$\frac{7}{8}$	.26	.39	.52
730	1	$1\frac{1}{4}$	$11\frac{1}{2}$	1	.28	.42	.56
731	$1\frac{1}{8}$	$1\frac{1}{2}$	$13\frac{1}{2}$	$1\frac{1}{8}$	.30	.45	.60
731a	$1\frac{1}{8}$	$1\frac{1}{2}$	$13\frac{1}{2}$	$1\frac{1}{8}$	.30	.45	.60
731b	$1\frac{1}{8}$	$1\frac{1}{2}$	$13\frac{1}{2}$	$1\frac{1}{8}$	.30	.45	.60
732	$\frac{1}{2}$	$\frac{3}{4}$	$6\frac{1}{2}$	$\frac{1}{2}$	.32	.48	.64
732a	$\frac{1}{2}$	$\frac{3}{4}$	$6\frac{1}{2}$	$\frac{1}{2}$	.32	.48	.64
733	$\frac{5}{8}$	$\frac{7}{8}$	$7\frac{1}{2}$	$\frac{5}{8}$	.36	.54	.72
734	$\frac{3}{4}$	1	$8\frac{1}{2}$	$\frac{3}{4}$	.40	.60	.80
735	$\frac{7}{8}$	$1\frac{1}{8}$	$9\frac{1}{2}$	$\frac{7}{8}$	.44	.66	.88
736	1	$1\frac{1}{4}$	$11\frac{1}{2}$	1	.51	.77	1.02
737	$1\frac{1}{8}$	$1\frac{1}{2}$	$13\frac{1}{2}$	$1\frac{1}{8}$	.58	.87	1.16

DOUBLE-HEAD TOOL POST WRENCHES



No.	Open End for U. S. Standard Nuts. Size Bolt	Closed End for Set Screw Size	Length Over All	Price Unfin- ished	Price Semi- Fin- ished	Price Fin- ished
124	$\frac{3}{8}$	$\frac{9}{16}$	$6\frac{1}{2}$	\$0.25	\$0.38	\$0.50
129	$\frac{1}{2}$	$\frac{5}{8}$	7	.30	.45	.60
131	$\frac{5}{8}$	$\frac{3}{4}$	$7\frac{1}{2}$	.30	.45	.60
132	$\frac{3}{4}$	$\frac{7}{8}$	$7\frac{1}{2}$	.35	.52	.70
139	$\frac{7}{8}$	1	8	.40	.60	.80
140	$\frac{1}{2}$	$\frac{3}{4}$	9	.50	.75	1.00
143	$\frac{3}{4}$	$\frac{1}{2}$				

DOUBLE-HEAD "S" WRENCH



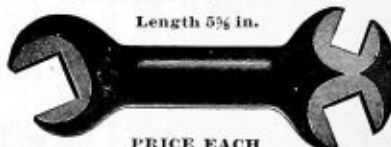
No.	Size of Opening	Thickness of Heads	Length Over All	Price Unfin- ished	Price Semi- Fin- ished	Price Fin- ished
220	$\frac{3}{4}$ x $\frac{7}{16}$	$\frac{1}{2}$	4	\$0.10	\$0.15	\$0.20
221	$\frac{1}{2}$ x $\frac{9}{16}$	$\frac{5}{16}$	5	.15	.23	.30
222	$\frac{3}{4}$ x $\frac{1}{2}$	$\frac{3}{8}$	6	.20	.30	.40
223	$\frac{1}{2}$ x $\frac{1}{2}$	$\frac{1}{2}$	7	.25	.38	.50
224	1 x $\frac{1}{2}$	$\frac{3}{4}$	8	.30	.45	.60
225	$1\frac{1}{2}$ x $\frac{1}{2}$	$\frac{1}{2}$	9	.35	.53	.70

SINGLE-HEAD BOX WRENCHES



No.	For Set Screw Size	Length Over All	Thickness of Head	Price Unfin- ished	Price Semi- Fin- ished	Price Fin- ished
250	$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{9}{32}$	\$0.10	\$0.15	\$0.20
251	$\frac{5}{16}$	$3\frac{1}{4}$	$\frac{3}{16}$	.11	.17	.22
252	$\frac{3}{8}$	$4\frac{1}{4}$	$\frac{3}{8}$	.13	.20	.26
253	$\frac{1}{2}$	$4\frac{1}{2}$	$\frac{1}{2}$	.16	.24	.32
254	$\frac{5}{8}$	$5\frac{1}{2}$	$\frac{1}{2}$	.19	.28	.38
255	$\frac{3}{4}$	$6\frac{1}{4}$	$\frac{1}{2}$	.22	.33	.44
256	$\frac{7}{8}$	7	$\frac{9}{16}$	.26	.39	.52
257	1	8	$\frac{3}{4}$	.30	.45	.60
258	$1\frac{1}{8}$	9	$\frac{1}{2}$	.36	.54	.72
259	$1\frac{1}{2}$	10	$\frac{3}{4}$	.44	.66	.88

TRIPLE HEAD SET SCREW WRENCH

For Set Screws $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ inchLength $5\frac{1}{2}$ in.

PRICE EACH

Unfinished, \$0.28 Semi-Finished, \$0.42 Finished, \$0.56

Note:—The openings in the wrenches listed on this page will admit of finishing to a larger size than given in table. With special openings, lots of 100 or more will be furnished at regular price. In less quantities, at a slight advance.

DROP FORGED STEEL WRENCHES

The steel from which our drop forged wrenches are made is selected for this particular purpose. Every detail of forging, milling and finishing is given closest attention. All drop forged steel wrenches will be furnished under the following headings:

"UNFINISHED"—Plain forging, not hardened

with openings either milled or unmilled. Milled openings sent unless otherwise ordered.

"SEMI-FINISHED" edges ground, case-hardened, heads bright, openings milled.

"FINISHED" openings milled, ground, polished, case-hardened, lacquered, with heads finished bright.

DOUBLE HEAD "S" WRENCHES



No.	Size Bolt U. S. Standard Nuts	Openings, inches	Extreme Length, inches	Thickness of Heads, inches	Price Unfinished, Each	Price Semi-Finished, Each	Price Finished, Each
601A	1/8"	5/16"	4	3/16"	\$0.13	\$0.20	\$0.26
601B	3/16"	7/16"	4	3/16"	.13	.20	.26
601C	1/4"	9/16"	4	3/16"	.13	.20	.26
602A	5/16"	1 1/16"	5	3/16"	.17	.26	.34
602B	3/8"	1 1/8"	5	3/16"	.17	.26	.34
602C	1/2"	1 1/4"	5	3/16"	.17	.26	.34
603A	5/8"	1 3/8"	6	3/16"	.22	.33	.44
603B	3/4"	1 1/2"	6	3/16"	.22	.33	.44
603C	7/8"	1 5/8"	6	3/16"	.22	.33	.44
604A	1"	1 7/8"	7	3/16"	.28	.42	.56
604B	1 1/8"	2"	7	3/16"	.28	.42	.56
604C	1 1/4"	2 1/8"	7	3/16"	.28	.42	.56
605A	1 1/2"	2 1/4"	9	3/16"	.36	.54	.72
605B	1 3/4"	2 3/8"	9	3/16"	.36	.54	.72
605C	2"	2 1/2"	9	3/16"	.36	.54	.72
606A	2 1/8"	2 7/8"	10	3/16"	.48	.72	.96
606B	2 1/4"	3"	10	3/16"	.48	.72	.96
606C	2 1/2"	3 1/8"	10	3/16"	.48	.72	.96
607A	2 3/4"	3 1/4"	12	3/16"	.72	1.08	1.44
607B	3"	3 1/2"	12	3/16"	.72	1.08	1.44
607C	3 1/8"	3 3/4"	12	3/16"	.72	1.08	1.44
608A	3 1/4"	4"	14	3/16"	1.10	1.65	2.20
608B	3 1/2"	4 1/8"	14	3/16"	1.10	1.65	2.20
608C	3 3/8"	4 1/4"	14	3/16"	1.10	1.65	2.20
Hex. Cap Screw, Sizes							
671A	1/8"	5/16"	4	3/16"	\$0.13	\$0.20	\$0.26
671B	3/16"	7/16"	4	3/16"	.13	.20	.26
671C	1/4"	9/16"	4	3/16"	.13	.20	.26
671D	5/16"	1 1/16"	4	3/16"	.13	.20	.26
672A	3/8"	1 1/8"	5	3/16"	.17	.26	.34
672B	1/2"	1 1/4"	5	3/16"	.17	.26	.34
672C	5/8"	1 3/8"	6	3/16"	.17	.26	.34
672D	3/4"	1 1/2"	6	3/16"	.17	.26	.34
673A	7/8"	1 5/8"	6	3/16"	.22	.33	.44
673B	1"	1 7/8"	7	3/16"	.22	.33	.44
673C	1 1/8"	2"	7	3/16"	.22	.33	.44
674A	1 1/4"	2 1/8"	7	3/16"	.28	.42	.56
674B	1 1/2"	2 1/4"	7	3/16"	.28	.42	.56
674C	1 3/4"	2 3/8"	7	3/16"	.28	.42	.56
675A	2"	2 1/2"	9	3/16"	.36	.54	.72
675B	2 1/8"	2 7/8"	9	3/16"	.36	.54	.72
675C	2 1/4"	3"	9	3/16"	.36	.54	.72
675D	2 1/2"	3 1/8"	9	3/16"	.36	.54	.72
676A	2 3/4"	3 1/4"	10	3/16"	.48	.72	.96
676B	3"	3 1/2"	10	3/16"	.48	.72	.96
676C	3 1/8"	3 3/4"	10	3/16"	.48	.72	.96
677A	3 1/4"	4"	12	3/16"	.72	1.08	1.44
677B	3 1/2"	4 1/8"	12	3/16"	.72	1.08	1.44
677C	3 3/8"	4 1/4"	12	3/16"	.72	1.08	1.44

No.	Square Head Cap Screws, Size, inches	Openings, inches	Extreme Length, inches	Thickness of Heads, inches	Price Unfinished, Each	Price Semi-Finished, Each	Price Finished, Each
689A	1/8"	5/16"	5	3/16"	\$0.17	\$0.26	\$0.34
689B	3/16"	7/16"	5	3/16"	.17	.26	.34
689C	1/4"	9/16"	5	3/16"	.17	.26	.34
689D	5/16"	1 1/16"	5	3/16"	.17	.26	.34
683A	3/8"	1 1/8"	6	3/16"	.22	.33	.44
683B	1/2"	1 1/4"	6	3/16"	.22	.33	.44
683C	5/8"	1 3/8"	6	3/16"	.22	.33	.44
683D	3/4"	1 1/2"	6	3/16"	.22	.33	.44
684A	7/8"	1 5/8"	6	3/16"	.28	.42	.56
684B	1"	1 7/8"	7	3/16"	.28	.42	.56
684C	1 1/8"	2"	7	3/16"	.28	.42	.56
684D	1 1/4"	2 1/8"	7	3/16"	.28	.42	.56
685A	1 1/2"	2 1/4"	9	3/16"	.36	.54	.72
685B	1 3/4"	2 3/8"	9	3/16"	.36	.54	.72
686C	2"	2 1/2"	9	3/16"	.48	.72	.96
687A	2 1/8"	2 7/8"	10	3/16"	.72	1.08	1.44
687B	2 1/4"	3"	10	3/16"	.72	1.08	1.44
687C	2 1/2"	3 1/8"	10	3/16"	.72	1.08	1.44
688A	2 3/4"	3 1/4"	12	3/16"	1.10	1.65	2.20
688B	3"	3 1/2"	12	3/16"	1.10	1.65	2.20
Set Screw Size, inches							
691A	1/8"	5/16"	4	3/16"	\$0.13	\$0.20	\$0.26
691B	3/16"	7/16"	4	3/16"	.13	.20	.26
691C	1/4"	9/16"	4	3/16"	.13	.20	.26
691D	5/16"	1 1/16"	4	3/16"	.13	.20	.26
692A	3/8"	1 1/8"	5	3/16"	.17	.26	.34
692B	1/2"	1 1/4"	5	3/16"	.17	.26	.34
692C	5/8"	1 3/8"	6	3/16"	.17	.26	.34
692D	3/4"	1 1/2"	6	3/16"	.17	.26	.34
693A	7/8"	1 5/8"	6	3/16"	.22	.33	.44
693B	1"	1 7/8"	7	3/16"	.22	.33	.44
693C	1 1/8"	2"	7	3/16"	.22	.33	.44
694A	1 1/4"	2 1/8"	7	3/16"	.28	.42	.56
694B	1 1/2"	2 1/4"	7	3/16"	.28	.42	.56
694C	1 3/4"	2 3/8"	7	3/16"	.28	.42	.56
695A	2"	2 1/2"	9	3/16"	.36	.54	.72
695B	2 1/8"	2 7/8"	9	3/16"	.36	.54	.72
695C	2 1/4"	3"	9	3/16"	.36	.54	.72
696A	2 1/2"	3 1/8"	9	3/16"	.36	.54	.72
696B	2 3/4"	3 1/4"	10	3/16"	.48	.72	.96
696C	3"	3 1/2"	10	3/16"	.48	.72	.96
697A	3 1/8"	3 3/4"	10	3/16"	.48	.72	.96
697B	3 1/4"	4"	12	3/16"	.72	1.08	1.44

HERCULES HIGH SPEED TWIST DRILLS

Toughest, strongest and most efficient High Speed Drills on the market. Drill perfect holes. All of the toughest steel retained on the cutting edge. Fully listed on page 442.

DROP FORGED STEEL WRENCHES

All Drop Forged Steel Wrenches will be furnished in the following conditions:

"UNFINISHED" Plain forging, not hardened, with openings either milled or unmilled. Milled openings sent unless otherwise ordered.

"SEMI-FINISHED" Edges ground, case hardened, heads bright, openings milled.

"FINISHED" Openings milled, ground, polished, case hardened, lacquered, with heads finished bright.

GENERAL PURPOSE WRENCHES



For use in erecting or dismantling plows, carriages, wagons, etc., and for general service where a light and long wrench is desired.

No.	Manufacturers' Standard Nuts, size Bolts, inches	Openings Finished, inches	Extreme Length, inches	Thickness of Heads, inches	Price Unfinished, Each	Price Semi-finished, Each	Price Finished, Each
500	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{1}{2}$	6 $\frac{1}{2}$	$\frac{1}{4}$	\$0.13	\$0.20	\$0.26
501	$\frac{7}{8}$ & $\frac{3}{4}$	$\frac{7}{8}$ & $\frac{3}{4}$	7 $\frac{1}{2}$	$\frac{1}{4}$	.17	.25	.34
502	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{2}$ & $\frac{3}{8}$	8 $\frac{1}{2}$	$\frac{1}{4}$	.22	.33	.44
503	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{1}{2}$	9 $\frac{1}{2}$	$\frac{1}{4}$	.24	.35	.46
504	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{2}$ & $\frac{3}{8}$	10 $\frac{1}{2}$	$\frac{1}{4}$	.24	.35	.46

Also furnished in sets containing one of each of above numbers, as follows:

	Finished	Semi-finished	Unfinished
In wooden boxes.....	\$2.45	\$1.85	\$1.30
In cloth boxes.....	2.73	2.16	1.59

DOUBLE HEAD SET SCREW TOOL POST WRENCHES



No.	Open End for Set Screws, size, inches	Closed End for Set Screws, size, inches	Length Over All, inches	Price Unfinished, Each	Price Semi-finished, Each	Price Finished, Each
201	$\frac{3}{4}$	$\frac{3}{4}$	5 $\frac{1}{2}$	\$0.21	\$0.32	\$0.42
202	$\frac{1}{2}$	$\frac{1}{2}$	6 $\frac{1}{2}$	.23	.35	.46
203	$\frac{3}{8}$	$\frac{3}{8}$	6	.23	.35	.46
204	$\frac{1}{4}$	$\frac{1}{4}$	6 $\frac{3}{4}$	.20	.30	.40
205	$\frac{3}{16}$	$\frac{3}{16}$	7 $\frac{1}{2}$	.20	.30	.40
206	$\frac{1}{8}$	$\frac{1}{8}$	7 $\frac{1}{2}$	.25	.35	.45

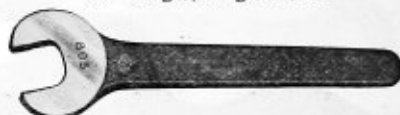
Holes broached. Closed end, 22 $\frac{1}{2}$ ° angle. Open end straight.

CHECK-NUT WRENCHES
15° Angle, Double Head

No.	Size U. S. Standard Nuts, inches	Openings, inches	Extreme Length, inches	Thickness of Heads, inches	Unfinished	Semi-finished	Finished
97 $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	8	$\frac{1}{2}$	\$0.43	\$0.65	\$0.86

CHECK NUT WRENCHES

15° Angle, Single Head



No.	For U. S. Standard Nuts, Size Bolts, inches	Openings Milled, inches	Extreme Length, inches	Thickness of Heads, inches	Unfinished	Semi-finished	Finished
800	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	4 $\frac{1}{4}$	$\frac{1}{4}$	\$0.11	\$0.17	\$0.22
801	$\frac{7}{8}$ & $\frac{3}{4}$	$\frac{1}{4}$	5 $\frac{1}{4}$	$\frac{1}{4}$	.13	.20	.25
802	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	6 $\frac{1}{4}$	$\frac{1}{4}$	.15	.23	.29
803	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	7 $\frac{1}{4}$	$\frac{1}{4}$	.18	.27	.36
804	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	8 $\frac{1}{4}$	$\frac{1}{4}$	.22	.33	.44
805	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	9 $\frac{1}{4}$	$\frac{1}{4}$	.28	.42	.56
806	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	10	$\frac{1}{4}$	.36	.54	.72
807	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	11 $\frac{1}{4}$	$\frac{1}{4}$	.46	.69	.92
808	1	$\frac{1}{4}$	13 $\frac{1}{4}$	$\frac{1}{4}$	.60	.90	1.20

15° Angle, Double Head

No.	For U. S. Standard Nuts, Size Bolts, inches	Openings Milled, inches	Extreme Length, inches	Thickness of Heads, inches	Unfinished	Semi-finished	Finished
825	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	6 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	\$0.25	\$0.38	\$0.50
826	$\frac{7}{8}$ & $\frac{3}{4}$	$\frac{1}{4}$	7 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.28	.42	.55
827	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	8 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.33	.50	.66
828	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	9 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.33	.50	.66
829	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	10 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.33	.50	.66
830	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	11 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.33	.50	.66
831	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	12 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.44	.66	.88
832	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	13 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.44	.66	.88
833	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	14 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.44	.66	.88
834	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$	15 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.60	.90	1.20
835	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$	16 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.60	.90	1.20
836	1	$\frac{1}{4}$	17 $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	.60	.90	1.20

CAR WRENCHES

22 $\frac{1}{2}$ ° Angle, Double Head

No.	For U. S. Standard Nuts, Size Bolts, inches	Openings, inches	Extreme Length, inches	Thickness of Heads, inches	Unfinished	Semi-finished
515	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	12	$\frac{1}{2}$ & $\frac{3}{8}$	\$0.50	\$0.75
516	$\frac{7}{8}$ & $\frac{3}{4}$	$\frac{1}{4}$ & $\frac{1}{4}$	13	$\frac{1}{2}$ & $\frac{3}{8}$	.85	1.28
517	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	14	$\frac{1}{2}$ & $\frac{3}{8}$	.85	1.28
518	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	15	$\frac{1}{2}$ & $\frac{3}{8}$	.92	1.38
519	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	16	$\frac{1}{2}$ & $\frac{3}{8}$	.92	1.38
520	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	17	$\frac{1}{2}$ & $\frac{3}{8}$	1.00	1.50
521	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	18	$\frac{1}{2}$ & $\frac{3}{8}$	1.00	1.50
522	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	19	$\frac{1}{2}$ & $\frac{3}{8}$	1.00	1.50
523	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	20	$\frac{1}{2}$ & $\frac{3}{8}$	1.10	1.65
524	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	21	$\frac{1}{2}$ & $\frac{3}{8}$	1.10	1.65
525	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	22	$\frac{1}{2}$ & $\frac{3}{8}$	1.10	1.65
526	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	23	$\frac{1}{2}$ & $\frac{3}{8}$	1.23	1.85
527	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	24	$\frac{1}{2}$ & $\frac{3}{8}$	1.32	1.85
528	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	25	$\frac{1}{2}$ & $\frac{3}{8}$	1.23	1.85
529	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	26	$\frac{1}{2}$ & $\frac{3}{8}$	1.40	2.10
530	$\frac{3}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{4}$	27	$\frac{1}{2}$ & $\frac{3}{8}$	1.40	2.10
531	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{1}{4}$	28	$\frac{1}{2}$ & $\frac{3}{8}$	1.70	2.55

CONSTRUCTION AND CAR BUILDERS' WRENCHES



15 Degree Angle

The round tang is for bringing bolt and rivet holes into line. The correct tool for use in the construction of roofs, bridges, cars, etc., can be inserted into convenient openings when wrench is not in use, always keeping tool in sight and preventing loss.

No.	For U. S. Standard Nuts, Size Bolts, inches	Opening Finished, inches	Extreme Length, inches	Thickness Head, inches	Price Unfinished, Each	Semi-finished, Each	Finished, Each
454	$\frac{3}{8}$	$1\frac{1}{8}$	14	$\frac{3}{8}$	\$0.50	\$0.75	\$1.00
455	$\frac{7}{16}$	$1\frac{1}{4}$	16	$\frac{7}{16}$	.65	.97	1.30
456	$\frac{1}{2}$	$1\frac{3}{8}$	17½	$\frac{1}{2}$	.85	1.28	1.70
457	1	1½	19	¾	1.10	1.65	2.20

CONSTRUCTION WRENCHES



With Offset and Straight Opening

No.	For U. S. Standard Nuts, Size Bolts, inches	Opening, inches	Extreme Length, inches	Thickness Head, inches	Unfinished, Each	Semi-finished Each
484	$\frac{3}{8}$	$1\frac{1}{8}$	$14\frac{1}{8}$	$\frac{3}{8}$	\$0.50	\$0.75
485	$\frac{7}{16}$	$1\frac{1}{4}$	16	$\frac{7}{16}$	.65	.97
486	$\frac{1}{2}$	$1\frac{3}{8}$	17½	$\frac{1}{2}$	.85	1.28
487	1	1½	19	¾	1.10	1.65

TRACK WRENCHES

Single End



Length.....	22 inches
For bolts, size inches.....	$\frac{3}{4}$ $\frac{7}{8}$ 1
Size opening, inches.....	$1\frac{1}{4}$ $1\frac{1}{2}$ $1\frac{3}{4}$
Weight, pounds.....	4½ 4½ 4½
Price per pound.....	\$0.25 \$0.25 \$0.25

Always specify sized nut to be used on.

TRACK WRENCHES

Double End

Length.....	24 inches
For bolts, size inches.....	$\frac{5}{8}$ & $\frac{3}{4}$ $\frac{3}{4}$ & $\frac{7}{8}$
Size openings, inches.....	$1\frac{1}{4}$ & $1\frac{3}{8}$ $1\frac{3}{4}$ & $1\frac{1}{2}$
Weight, pounds.....	6 6
Price per pound.....	\$0.40 \$0.40

"FITTING UP" WRENCHES



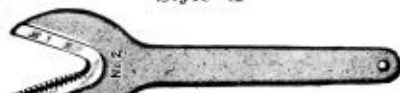
Fig. 105

With offset and tapered to $\frac{1}{4}$ at point.
For $\frac{3}{8}$ to 1 inch bolts.....Price each, \$1.00

ALLIGATOR OR BULL DOG WRENCHES

Made in Three Styles

Style "A"



Style "B"



Style "C" (Twin)



Style "A" Black finish, heavy pointed jaws

No.	Length, inches	Holds Pipe, inches	Holds Round Iron, inches	Price Each	Price per Dozen
2	9	$\frac{3}{8}$ to $\frac{3}{4}$	$\frac{1}{2}$ to 1	\$1.20	\$12.00
2½	12½	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to $1\frac{1}{4}$	1.80	18.00
3	16	$\frac{1}{2}$ to $1\frac{1}{4}$	$\frac{3}{4}$ to $1\frac{3}{8}$	2.40	24.00
4	22	$1\frac{1}{4}$ to 2	$1\frac{1}{2}$ to $2\frac{1}{2}$	3.60	36.00
4½	24	$1\frac{3}{4}$ to $2\frac{1}{2}$	$1\frac{5}{8}$ to 3	5.00	50.00
5	27	2 to 3	$2\frac{1}{4}$ to $3\frac{1}{2}$	6.00	60.00

Style "B," Nos. 0 and 1 are full polished.

Nos. $1\frac{1}{2}$ and $1\frac{3}{4}$ black finish, heavy polished jaw.

No.	Length, inches	Holds Pipe, inches	Holds Round Iron, inches	Price Each	Price per Doz
0	4	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	\$0.30	\$3.00
1	5¾	$\frac{1}{8}$ to $\frac{3}{8}$	$\frac{1}{4}$ to $\frac{3}{4}$	.40	4.00
1½	5¾	$\frac{1}{8}$ to $\frac{3}{8}$	$\frac{1}{4}$ to $\frac{3}{4}$	.45	4.50
1¾	7½	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to $1\frac{1}{8}$	.80	8.00

Style "C" or Twin

No.	Length, inches	Holds Pipe, inches	Holds Round Iron, inches	Price Each	Price Per Dozen
"C"	10	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	\$1.80	\$18.00

"ALWAYS READY" WRENCH



Manufactured from special steel, forged and tempered in oil.

No.	Length inches	Holds Round Iron	NICKEL PLATED		CHECKERED	
			Price Each	Price per Dozen	Price Each	Price per Dozen
1	5	$\frac{1}{4}$ to $\frac{3}{4}$	\$0.50	\$ 5.00	\$0.45	\$ 4.60
2	7	$\frac{1}{4}$ to $1\frac{1}{4}$	.65	6.75	.60	6.30
2½	9½	$\frac{1}{4}$ to $1\frac{3}{4}$	1.05	10.50	1.00	10.00
3	11½	$\frac{3}{4}$ to 2	1.60	16.00	1.50	15.25

Cut shows Nickel Plated Wrench which is always sent unless otherwise ordered.

Checkered Finish Wrenches have heavy polished jaws.

STILLSON ADJUSTABLE PIPE WRENCHES



Length Open	Takes Pipe up to	Each	EXTRA PARTS, PRICE EACH				
			Jaw	Frame	Steel Handle	Nut	Wood Handle Grip
6	1/2	\$2.00	\$0.75	\$0.35	\$0.95	\$0.11	\$0.16
8	3/4	2.00	.75	.35	.95	.11	.16
10	1	2.25	.80	.40	1.10	.14	.18
14	1 1/4	3.00	1.00	.50	1.45	.17	.25
18	2	4.00	1.33	.55	2.10	.22	.28
24	2 1/2	6.00	2.10	.80	3.20	.35	.....
36	3 3/8	12.00	4.75	1.30	6.40	.55	.....
48	1 to 5	18.00	7.25	1.50	9.25	.95	.....

Sizes 6 to 18 inch inclusive, have wood handle grips. Larger sizes are all steel.

All sizes up to 24 inch inclusive, are packed in wooden boxes of 1/2 doz. each. 36 and 48 inch, packed in 1-6 doz. boxes.

TRIMO ADJUSTABLE PIPE WRENCHES

(All Steel)



Length Open	Takes Pipe up to	Price Each	Weight Each, lbs.	Length Open	Takes Pipe up to	Price Each	Weight Each, lbs.
6	1/2	\$2.00	1/2	18	2	\$ 4.00	5
8	3/4	2.00	3/4	24	2 1/2	6.00	7 1/2
10	1	2.25	1 1/2	36	3 1/2	12.00	16
14	1 1/4	3.00	2 3/4	48	1 to 5	18.00	24

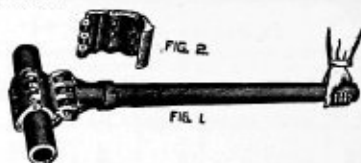
EXTRA PARTS, PRICE EACH

For Wrench, inches	Mov- able Jaw	Nut	In- serted Jaw	Frame	Springs	Frame Pins	Jaw Pins
6	\$0.67	\$0.20	\$0.25	\$0.25	\$0.03	\$0.03	\$0.03
8	.67	.20	.25	.25	.03	.03	.03
10	.75	.27	.33	.33	.03	.03	.03
14	1.00	.35	.50	.45	.03	.03	.03
18	1.33	.42	.55	.55	.04	.04	.04
24	2.00	.50	.65	.65	.04	.04	.04
36	4.00	.65	1.00	.75	.04	.04	.04
48	6.00	.80	1.25	1.00	.04	.04	.04

All sizes to 24 inch inclusive, packed in wooden boxes of 1/2 doz. 36 and 48 inch in 1-6 doz. boxes.

PARMELEE'S GIRDLE PIPE WRENCHES

Quick motion and sure catch; works like a ratchet. Does not crush or mar the pipe. For brass or plated pipe it has no equal. Can be used on threaded bolts and nipples without the slightest injury to them.



No.	Size, inches	For Pipe, inches	Price Each, Complete	Extra Stocks Each	Extra Girths Each
1	10	3/8, 1/2, 3/4, 1,	\$5.00	\$2.25	\$0.75
2 1/2	20	3/4, 1, 1 1/4, 1 1/2, 2	7.50	2.50	1.25
3 1/2	25	1 1/2, 2, 2 1/2, 3	7.50	3.00	1.25

WESTCOTT'S ADJUSTABLE PIPE WRENCHES



Length, inches	Takes Pipe, inches	Price Each	Price per Dozen
6	1/8 to 3/8	\$1.20	\$12.00
8	1/8 to 3/4	1.50	15.00
10	1/8 to 1	1.80	18.00
12	1/8 to 1 1/4	2.40	24.00
14	1/8 to 1 1/2	3.00	30.00

BROWN'S ADJUSTABLE PIPE TONGS



No.	For Pipe, inches	Price Each	No.	For Pipe, inches	Price Each
1	1/8 to 3/4	\$0.60	4	1 1/2 to 3	\$ 2.70
1 1/2	3/8 to 1	.75	5	2 1/2 to 4	6.00
2	1/2 to 1 1/4	.85	6	3 to 5	10.00
3	1 to 2	1.20	7	4 to 7	11.00

COMMON PIPE TONGS



For Pipe, inches	Price Each	For Pipe, inches	Price Each
1/8	\$0.60	1	\$1.10
1/4	.65	1 1/4	1.30
3/8	.70	1 1/2	1.50
1/2	.75	2	1.90
3/4	.90	.....	.....

CHAIN PIPE WRENCHES



"VICTOR"

The "Victor" is a reversible chain wrench, made in six sizes. The jaws are interchangeable. Hitch comes on the shoulder which is forged with the handle and reinforces the jaws. The "Victor" is practical, strong, strictly first class in material and workmanship, and fully guaranteed.

Size.....	No. 11	No. 12	No. 13	No. 13½	No. 14	No. 15
Capacity.....	½ to 1½ in.	2 to 2½ in.	¾ to 4 in.	1 to 6 in.	1½ to 8 in.	2 to 12 in.
Length.....	19½ in.	28 in.	38¼ in.	44 in.	50½ in.	64½ in.
Weight.....	4¾ lbs.	9 lbs.	17½ lbs.	21 lbs.	29 lbs.	49 lbs.
With Flat-Link Chain.....Each	\$3.50	\$5.00	\$7.00	\$9.00	\$11.00	\$18.00
Extra Flat-Link Chain.....Each	1.00	1.50	2.50	3.25	4.00	6.00
Extra Jaws.....Per Pair	1.75	2.75	4.00	4.75	5.50	7.50

"VULCAN"

For Turning or Holding Pipe, Pipe-fittings, Bolts, Bars, Shafts, Etc.,
from 1-8 to 18 inches Diameter



Strong and durable; made entirely from wrought steel; jaws are drop forged and have saw temper. This wrench is furnished with either cable or flat link chain and is adapted for both; flat link chain always sent unless otherwise specified.

No.	Takes Pipe, inches	Length, inches	Weight, lbs.	With Flat Link Chain, Each	Extra Chains, Each
10	½ to ¾	13¾	1¾	\$ 2.50	\$ 0.75
11	¾ to 1½	20	4¾	3.50	1.00
12	¾ to 2½	27	8¾	5.00	1.50
13	¾ to 4	37	16	7.00	2.50
13½	1 to 6	44½	21	9.00	3.25
14	1½ to 8	50½	29	11.00	4.00
15	2 to 12	64½	49	18.00	6.00
16	4 to 18	87	137	40.00	13.00

"IDEAL"



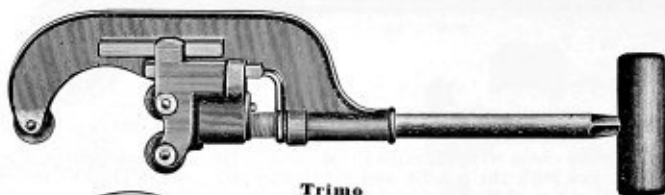
Has double set of jaws—outer set for pipe—inner set for fittings, valves, etc.; automatic chain lock. All parts are interchangeable. Construction is simple and powerful—jaws drop forged from tool steel and have saw temper; every wrench guaranteed.

No.	Takes Pipe, inches	Length, inches	Weight, lbs.	Price, Each	Price Jaws, pair.	Price Handles, Each	Price Chains, Each	Price Pins, Each	Price Bolts, Each
2	½ to 3	27	10	\$ 6.00	\$3.25	\$2.10	\$0.95	\$0.15	\$0.29
3	1 to 4	38	18	8.00	4.50	3.25	1.20	.20	.25
4	2 to 6	49	28	11.00	5.85	4.75	1.70	.25	.30
5	2½ to 10	60	50	16.00	9.50	6.90	3.00	.30	.35

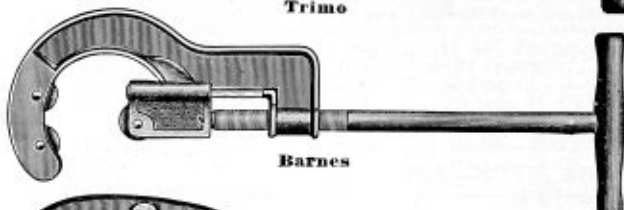
If wrench is wanted with flat link chain; add 15 per cent to list price.

PIPE CUTTERS

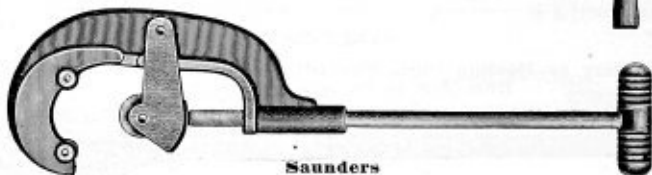
Three wheel pipe cutters cut more rapidly than most other styles. They are an indispensable shop tool and are especially adapted for cutting in corners and close quarters. The rollers turn down burr made in cutting pipe and permit threading after cutting without further labor.



Trimo



Barnes



Saunders



Armstrong

TRIMO

No.	Cuts Pipe, inches	Price Each	EXTRA PARTS			
			Wheels	Nuts	Rolls	Blocks
1	$\frac{1}{4}$ to $1\frac{1}{4}$	\$ 4.50				
2	$\frac{1}{2}$ to 2	6.00	\$0.30	\$0.35	\$0.30	\$1.25
3	$1\frac{1}{2}$ to 3	10.00	.30	.35	.30	1.25
			.40	.40	.40	1.75
						2.25
						2.50

BARNES

No.	Cuts Pipe, inches	Price Each	EXTRA PARTS				
			Wheels	Pins	Hooks	Slides	Handles
1	$\frac{1}{4}$ to 1	\$ 4.50	\$0.25	\$0.10	\$ 2.00	\$0.75	\$1.00
2	$\frac{1}{2}$ to 2	6.00	.30	.10	2.85	1.00	1.25
3	$1\frac{1}{2}$ to 3	10.00	.40	.10	4.55	2.00	2.25
4	$2\frac{1}{2}$ to 4	20.00	.50	.15	9.50	4.50	4.50
5	4 to 6	30.00	.75	.15	13.75	7.00	7.00
6	6 to 8	40.00	.75	.15	20.00	8.50	9.25

SAUNDERS

No.	Cuts Pipe, inches	Price Each	EXTRA PARTS			
			Blocks and Wheels	Wheels	Rollers	Pins
1	$\frac{1}{4}$ to 1	\$ 3.00	\$1.25	\$0.24	\$0.24	\$0.10
2	1 to 2	4.50	1.75	.32	.32	.10
3	2 to 3	11.00	2.75	.60	.50	.15
4	$2\frac{1}{2}$ to 4	18.00	3.50	.60	.50	.15
5	4 to 6	28.00	4.00	.60	.60	.15

ARMSTRONG

No.	Cuts Pipe, inches	Price Each	EXTRA PARTS				
			Wheels	Pins	Rollers	Hooks	Handles
1	$\frac{1}{4}$ to $1\frac{1}{4}$	\$4.50	\$0.25	\$0.10	\$0.25	\$0.75	\$0.75
2	$\frac{1}{2}$ to $2\frac{1}{2}$	6.00	.30	.10	.30	1.00	1.00
3	$1\frac{1}{2}$ to 4	15.00	.50	.15	.50	2.75	1.75

ELLIS PIPE CUTTERS



For use by Water and Gas Works, Well Drillers, Contractors, Plumbers, Railroads, Etc.

The flexible cutter carrying links allow it to conform to the surface of the pipe.

The cutter wheels in contact with the pipe at many points make it non-crushing.

The many cutter wheels allow it to be used where the handle can only be moved a small part of a circle. It will work in a corner or down in a hole.

Number	Soil Pipe	01	1
Cuts Cast Iron Pipe.....	3 to 8	4 to 12	
Cuts Wrought Iron Pipe..	2 to 4	3 1/2 to 8	4 to 12
Cuts Kalamein Lock Joint Pipe.....	2 to 6	4 to 9	5 to 13
Cuts Cast Iron Soil Pipe ..	2 to 6		
Price Complete.....	\$15.00	\$32.00	\$55.00
Extra Wheels (any kind pipe).....	.20	.40	.40
Extra Thumb Bolts and Nuts	.20	.40	.40
Extra Wheel Pins .....	.10	.20	.20
Net Weight, pounds	9	35	40

Four kinds of cutter wheels made—C. I., W. I., Soil Pipe and Kalamein.

THE ECK PIPE CUTTER



High grade material; simple in construction and dependable. Cuts easily and quickly, leaves no feather edge and does away with reaming. All parts are interchangeable. Prices on extra parts quoted on application.

No.	Cuts Pipe, inches	Price Each	Extra Wheels
1		\$1.50	\$0.20
2		2.50	.25

STANWOOD PIPE CUTTERS

This Cutter has many points of superiority over any one Wheel Cutter in the market, combining simplicity, strength and lightness. It is made of best Malleable Iron and Tool Steel.



Size No.	Cuts, inches	Cutter Complete	Wheels, Each	Pins, Each
1	1/8 to 1	\$1.50	\$0.12	\$0.05
2	3/4 to 2	2.25	.18	.05
3	1 1/4 to 3	7.00	.25	.10

Table Showing Width and Diameter of Cutter Wheels

DIAMETER—INCHES

Number	Trimmo	Barnes	Saunders	Armstrong	Stanwood
1	1 1/8	1 1/2	1	1 1/8	1
2	1 1/8	1 1/4	1 1/4	1 1/8	1 1/4
3	1 1/8	1 1/4	1 1/8	1 1/8	1 1/4
4		1 1/8	1 1/8		1 1/8
5		1 1/8	1 1/8		1 1/8
6		1 1/8	1 1/8		1 1/8

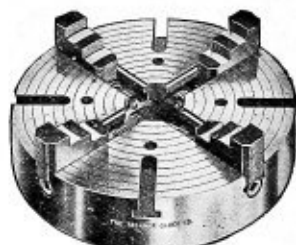
THICKNESS—INCHES

Number	Trimmo	Barnes	Saunders	Armstrong	Stanwood
1	3/4	3/4	1 1/2	.420	1 1/2
2	3/4	3/8	1 1/2	.450	1 1/2
3	3/8	3/8	5/8	.500	1 1/2
4		1/2	5/8		5/8
5		1/2	5/8		5/8
6		1/2	5/8		5/8

H.Channon Company. Chicago.

SKINNER OR HORTON LATHE CHUCKS

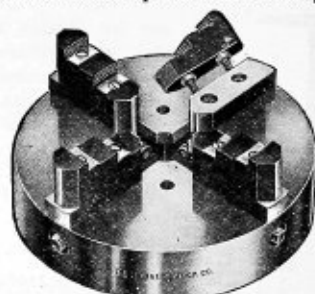
NOTE: Horton Chucks are fully listed in Discount Sheet which accompanies this Catalog.



Skinner Independent, 4 Reversible Jaws

Four Jaw Independent Chucks: Heavy pattern; solid steel, one-piece, reversible jaws with steps ground on face after being hardened and mounted in chucks; this insures absolute accuracy. Face of chuck is ground true to straight edge and is accurately graduated in inches. Have flush screws threaded their entire length and turned end bearings of hardened steel.

Universal and Combination Chucks: Furnished with either three or four patent reversible jaws, steps ground in face same as Independent. Upper and lower half of jaws are counter-bored and hardened steel ring inserted so that end thrust does not come on screws. Screws simply clamping jaws together. Have flush screws, threaded entire length and turned end bearings of hardened steel.



Skinner Universal or Combination Three or Four Jaws

FOUR JAW—INDEPENDENT

Order by these Numbers	Rated Size of Chuck, inches	Will Hold About, inches	Approximate Shipping Weight, pounds	Price, Each	Order by these Numbers	Rated Size of Chuck, inches	Will Hold About, inches	Approximate Shipping Weight, pounds	Price, Each
904	4½	6	10	\$14.00	918	18	21	175	\$ 44.00
906	6	7½	17	18.00	920	20	23	195	50.00
908	8	9½	34	22.00	921	21	24	215	55.00
909	9	11½	42	24.00	922	22	25	226	57.00
910	10	12½	49	26.00	924	24	27	270	65.00
912	12	14½	80	30.00	926	26	29	315	80.00
914	14	16½	105	34.00	928	28	31	340	100.00
915	15	18	122	36.00	930	30	35	485	120.00
916	16	19	133	38.00	936	36	41	715	210.00

THREE AND FOUR JAW UNIVERSAL

THREE JAW		FOUR JAW		Will Hold, inches	Rated Size Chuck, inches	THREE JAW		FOUR JAW		Will Hold, inches	Rated Size Chuck, inches
No.	Price, Each	No.	Price, Each			No.	Price, Each	No.	Price, Each		
303 J	\$18.00	.....	.....	3¾	3	318 J	\$ 62.00	418 J	\$ 75.00	18½	18
304 J	22.00	404 J	\$26.00	4 1/8	4	321 J	80.00	421 J	95.00	21¼	21
305 J	25.00	405 J	30.00	5¼	5	324 J	100.00	424 J	120.00	25	24
306 J	26.00	406 J	32.00	7¼	6	326 J	130.00	426 J	160.00	28½	26
308 J	30.00	408 J	38.00	8½	8	330 J	170.00	430 J	200.00	31¾	30
309 J	34.00	409 J	42.00	9½	9	336 J	230.00	436 J	285.00	37	36
312 J	44.00	412 J	56.00	12½	12	342 J	270.00	442 J	325.00	42¼	42
315 J	52.00	415 J	64.00	16½	15	.....	.....	.....	.....	.....	..

THREE AND FOUR JAW COMBINATION

THREE JAW		FOUR JAW		Will Hold, inches	Rated Size Chuck, inches	THREE JAW		FOUR JAW		Will Hold, inches	Rated Size Chuck, inches
No.	Price, Each	No.	Price, Each			No.	Price, Each	No.	Price, Each		
603 J	\$18.00	.....	.....	3¾	3	618 J	\$ 62.00	818 J	\$ 75.00	18½	18
604 J	22.00	804 J	\$26.00	4 1/8	4	621 J	80.00	821 J	95.00	21¼	21
605 J	25.00	805 J	30.00	5¼	5	624 J	100.00	824 J	120.00	25	24
606 J	26.00	806 J	32.00	7¼	6	626 J	130.00	826 J	160.00	28½	26
608 J	30.00	808 J	38.00	8½	8	630 J	170.00	830 J	200.00	31¾	30
609 J	34.00	809 J	42.00	9½	9	636 J	230.00	836 J	285.00	37	36
612 J	44.00	812 J	56.00	12½	12	642 J	270.00	842 J	325.00	42¼	42
615 J	52.00	815 J	64.00	16½	15	.....	.....	.....	.....	.....	..

Universal: All Jaws operated at once, having a common center. **Combination:** Jaws Operated Universally or Independently. Blank Face Plates for above Chucks carried in stock.

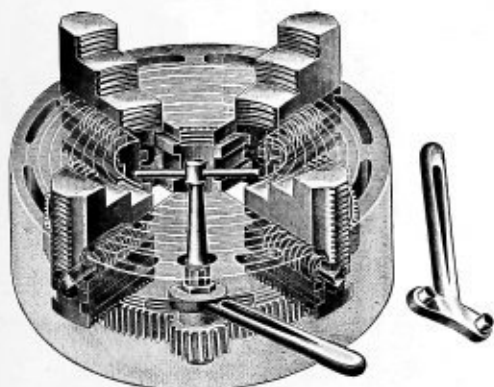
CUSHMAN 4-JAW INDEPENDENT LATHE CHUCKS

These Chucks have heavy bodies and solid, one-piece reversible steel jaws. The steel screws are of large diameter, with heavy square thread and have turned bearings at each end. Chucks are of large capacity and are designed for the very hardest service.



Nominal Size, inches	Price, Each	Will Hold, inches	Hole in Body, inches	Diameter of Recess for Flange, inches	Nominal Size, inches	Price, Each	Will Hold, inches	Hole in Body, inches	Diameter of Recess for Flange, inches
4½	\$14.00	6	1	4½	18	\$ 44.00	21	4	9½
6	18.00	7½	1 ⅜	5½	20	50.00	23	4	9½
8	22.00	9½	1¾	4¾	22	57.00	25	5	11
9	24.00	11½	1¾	4¾	24	65.00	27	5	11
10	26.00	12½	2	5½	26	80.00	29	5	12
12	30.00	14½	2¾	6 ⅜	28	100.00	31	5	13
14	34.00	16½	3	6 ⅜	30	120.00	35	5	15
15	36.00	18	3	7 ⅜	36	210.00	41	6	17¾
16	38.00	19	3	7 ⅜	....	.....	....	....	.....

Bolts for attaching and key wrench for operating, furnished with each Chuck.



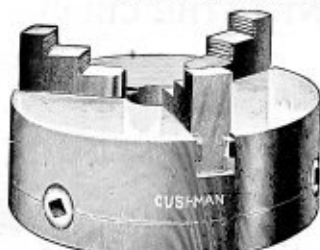
WESTCOTT'S SCROLL COMBINATION LATHE CHUCKS

A scroll combination (Universal or Independent Jaw), with spur (not beveled) gears. Jaws can be operated either from face of Chuck or edge and are reversible. This Chuck can also be furnished as a strictly universal Chuck. Screw heads are flush; it is quick operating, has a strong grip, great capacity and perfect adjustment.

Diameter, inches	Price, Three Jaws	Price, Four Jaws	Will Hold, inches	Diameter Recess, inches
8	\$ 26.00	\$ 32.00	8½	3½
10½	34.00	42.00	12	4 ⅞
13¼	44.00	56.00	15	5 ⅞
16	52.00	64.00	18	6¾
18½	62.00	75.00	21½	7 ⅞
21¼	80.00	95.00	26	9½
24	100.00	120.00	30	10
27	135.00	160.00	33	12¾
30	170.00	200.00	36	12¾
36	230.00	285.00	43	15

H.Channon Company. Chicago.

CUSHMAN GEARED SCROLL CHUCK



No. 1 Style Jaw

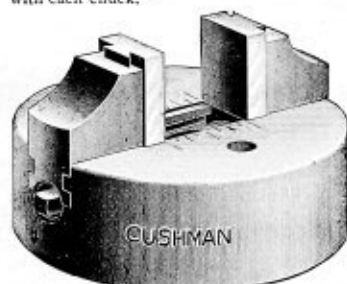


No. 2 Style Jaw

Strictly a universal chuck, jaws working together by means of a scroll threaded plate; commonly used for holding round pieces; small size jaws are made of special crucible steel; larger sizes of Open Hearth Steel, carefully hardened. No Malleable or Steel Castings used. Designed for hard service generally, and being perfectly balanced, are well adapted for use on high speed machines.

Diameter, inches	3 JAW			4 JAW			Diameter Hole, inches	Diameter Recess for Face Plate, inches
	With One Set Jaws, Each	With Two Sets Jaws, Each	Extra Jaws, Set	With One Set Jaws, Each	With Two Sets Jaws, Each	Extra Jaws, Set		
2	\$ 7.00	\$ 8.50	\$ 2.25	.....	.....	.....	1/2	1 1/2
2 1/2	8.00	9.50	2.25	.....	.....	.....	5/8	1 7/8
3	10.00	12.00	3.00	\$10.75	\$13.35	\$ 4.00	5/8	2 1/8
4	12.00	14.40	3.75	13.00	16.20	5.00	1	3 1/4
5	15.00	18.00	4.50	16.20	20.20	6.00	1 1/4	3 3/4
6	18.00	21.60	5.50	19.50	24.30	7.30	1 1/2	4 1/4
7 1/2	21.00	25.20	6.75	22.25	28.40	9.00	2	4 3/4
9	24.00	28.80	9.00	26.00	32.40	12.00	2 1/2	5 1/2
10 1/2	27.00	32.40	10.50	29.10	36.40	14.00	3	5 3/4
12	30.00	36.00	12.00	32.40	40.40	16.00	3	7

Two sets of Jaws sent unless otherwise specified. Screws for attaching to face plate and key wrench for operating furnished with each chuck.



Round Body Chucks

CUSHMAN ROUND
BODY AND BOX BODY
CHUCKS

With either independent or universal jaws; jaws dovetailed for slips. Box body chucks can also be furnished having hub which can be threaded to fit spindle of machine.

Box Body Chucks
with recess for face plate

ROUND BODY CHUCKS

Nominal Size, inches	Price Each	Hole Through Body, inches	Diam. Recess, inches	Jaws Open, inches	Weight, pounds	Extra Slips per Pair
4 1/2	\$16.00	1	4 1/8	2	10	\$1.00
6	21.00	1 1/4	5 5/8	2 1/2	20	1.00
7	24.00	1 1/2	5 5/8	3	33	1.00
9	30.00	1 3/4	5 5/8	4	49	1.25
12	36.00	2 1/4	6 5/8	6	79	1.25

BOX BODY CHUCKS

Nominal Size, inches	Price Each	Diam. Recess, inches	Jaws Open, inches	Length Body, inches	Width Body, inches	Weight, pounds	Extra Slips per Pair
7	\$24.00	4 3/4	3	7	3	20	\$1.00
9	30.00	5 5/8	4	9	4	31	1.25
12	36.00	7	6	12	4 1/2	48	1.25
15	42.00	7	8	15	5	75	1.50
18	60.00	9 1/2	10	18	5 3/4	125	2.00

One pair Machinery Steel Slips furnished; Tool Steel Slips may be added. Always state whether Round or Box Body, Independent or Universal Jaws are wanted.



Square Base

Round Swivel Base
Accurately Graduated in inches

SKINNER PLANER CHUCKS

For Holding Either Straight or Taper Work. Can Be Adjusted Instantly

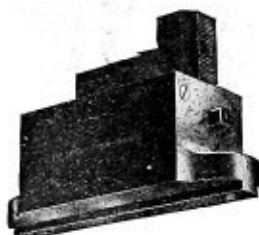
These chucks are heavy and strong, are accurately made of the best materials

No.	Length Jaw, inches	Depth Jaw, inches	Jaws, Open, inches	PRICE EACH		No.	Length Jaw, inches	Depth Jaw, inches	Jaws, Open, inches	PRICE EACH	
				Round Base	Square Base					Round Base	Square Base
6	7	1 1/2	3 1/2	\$25.00	\$20.00	15	15 1/2	2 1/2	9 1/2	\$50.00	\$45.00
8	9	1 7/8	5	30.00	25.00	18	18 1/2	2 3/4	11 1/4	60.00	55.00
10	11	2 1/4	6	26.00	30.00	24	24 1/4	2 3/4	16	90.00	75.00
12	13	2 3/4	8	40.00	35.00	30	30 3/4	3	21 1/2	140.00	120.00

SKINNER REVERSIBLE FACE PLATE JAWS

*Size, inches	Approximate Shipping Weight, per Set Four Jaws, Pounds	Price per Set of Three	Price per Set of Four
6	100	\$ 35.00	\$ 48.00
8	135	45.00	60.00
10	240	60.00	80.00
12	270	90.00	120.00
14	375	120.00	160.00

*The size given is the same as the length of the jaw.



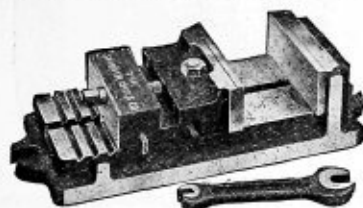
CUSHMAN REVERSIBLE FACE PLATE JAWS

Jaws are Carefully Case-Hardened, are Reversible, End for End Made Heavy and Very Strong From Very Best Material



Size, inches	Approximate Weight, Set Four Jaws, Pounds	Price Set Three Jaws	Price Set Four Jaws
6	110	\$ 36.00	\$ 48.00
8	180	45.00	60.00
10	240	60.00	80.00
12	270	90.00	120.00
14	375	120.00	160.00

SKINNER DRILL PRESS VISE



A Well Made Handy Vise for General Machine Shop Use; Workmanship and Material Strictly First-Class in Every Respect

Size No.	DIMENSIONS OF JAW, INCHES			Approximate Weight, Pounds	Price, Each
	Width	Depth	Opens		
4 1/2	4 1/2	2	5	37	\$15.00
6 1/2	5 1/2	2	6	43	18.00

ARMSTRONG DRILL PRESS VISE

For General Machine Shop Use



Jaws are of Tool Steel; Instantly Adjustable to Any Size Within Its Capacity. Adapted for Light or Heavy Work

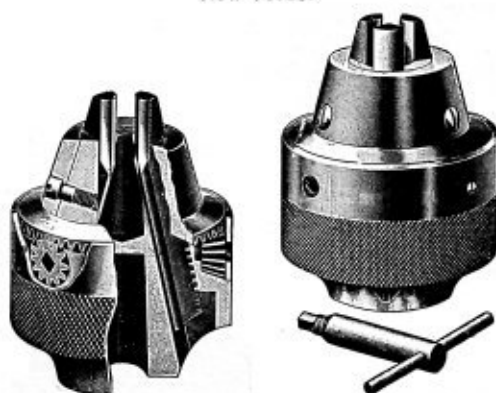
No.	CAPACITY, INCHES			Weight, Pounds	Price, Each
	Width of Jaw	Depth of Jaw	Opens		
1-V	2	1 1/2	1 1/2	4 1/2	\$ 6.00
2-V	2 3/4	1 3/4	2 1/2	8 1/2	9.00
3-V	3 1/2	1 3/4	3	16	14.00

Each Vise packed in card-board box

DRILL CHUCKS

SKINNER "GEARED PATTERN"

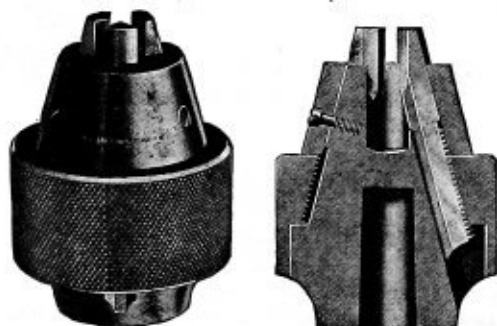
New Model



Will hold high speed drills driven to their limit. Carefully constructed from the best grade of steel. Jaws are ground true in chuck after hardening. Operated by hand, or by key wrench if an extra strong grip is required. Can be readily taken apart for cleaning and oiling. Fully warranted for hard service and accuracy.

No.	Capacity, inches	Price, Each
21	0 to $\frac{1}{4}$	\$ 6.00
22	0 to $\frac{3}{8}$	6.00
23	0 to $\frac{1}{2}$	10.00
24	$\frac{1}{8}$ to $\frac{3}{4}$	18.00

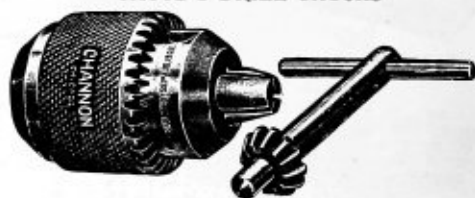
SKINNER "NEW MODEL" DRILL CHUCK



For general work and rapid drilling. Made entirely of steel and in the most careful manner. Accuracy guaranteed.

No.	Capacity, inches	Price Each
11	0 to $\frac{1}{8}$	\$5.50
12	0 to $\frac{3}{16}$	5.50
13	0 to $\frac{1}{4}$	9.00

JACOB'S DRILL CHUCKS



No.	Capacity, inches	Price, Each	PRICES—EXTRA PARTS		
			Sleeves	Jaws	Wrenches
1	0 to $\frac{1}{8}$	\$ 6.00	\$0.55	\$0.55	\$0.30
2	0 to $\frac{1}{4}$	7.50	.55	.55	.30
3	0 to $\frac{3}{8}$	9.00	.90	.90	.45
4	0 to $\frac{1}{2}$	11.00	1.50	1.50	.75
5	$\frac{3}{8}$ to 1	13.00	2.25	2.25	1.25

Nos. 4 and 5 special for high speed drills.

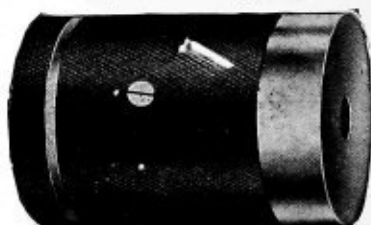
ALMOND PATENT DRILL CHUCKS



No.	Capacity, inches	Price Each
1	0 to $\frac{3}{8}$	\$5.50
2	0 to $\frac{1}{2}$	5.50
3	0 to $\frac{1}{2}$	9.00

Above prices do not include arbor.

THE GRONKVIST DRILL CHUCK



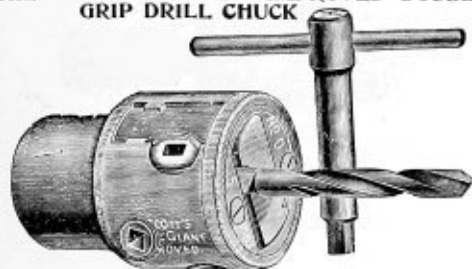
Automatic positive grip. Can change drills instantly without wrench and without stopping machine. Absolutely accurate.

No.	Capacity, inches	Price Each
0	$\frac{1}{16}$ to $\frac{3}{16}$	\$5.50
1	$\frac{1}{8}$ to $\frac{1}{4}$	6.50
2	$\frac{3}{16}$ to $\frac{1}{2}$	7.00
3	$\frac{1}{4}$ to $\frac{1}{2}$	7.50
4	$\frac{1}{2}$ to $\frac{3}{4}$	8.00

Drill Chucks for Holding Norka Two-Groove and Flat Beaded Shank HIGH SPEED DRILLS Listed Elsewhere. See Index.

DRILL CHUCKS

THE "LITTLE GIANT" IMPROVED DOUBLE GRIP DRILL CHUCK



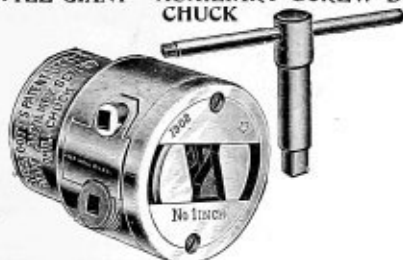
No.	Approx. Diam. in.	Holding Drills, inches	Price	Screws	Jaws, per Set
0	2 1/2	0 to 1 1/2	\$ 8.00	\$1.00	\$2.25
1	3	0 to 3/4	9.00	1.00	2.50
2	3 1/2	0 to 1	10.00	1.10	2.75
3	4	0 to 1 1/2, extra strong	11.00	1.50	3.50
3 1/2	6	0 to 1 1/2	18.00	2.50	5.00
4	6 1/2	0 to 2	20.00	3.00	6.25

Sizes No. 0 to No. 4 are for use with Arbor.

Nos. 3 and 4 are for Face Plate.

When ordering duplicate parts, state whether chuck is stamped with a ★ or not, and if so, whether it is stamped REVERSED. Also date of MANUFACTURE (not date of patent) stamped on end (number of month and year), and whether Little Giant Improved or Little Giant Double Grip.

"LITTLE GIANT" AUXILIARY SCREW DRILL CHUCK



The Auxiliary Screw entirely overcomes the tendency of gripping part of jaws to crowd away from right and left hand screw and outer end to draw toward it, which tendency is found in all side screw chucks. This Auxiliary Screw also greatly increases the gripping power of Chuck.

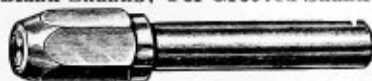
Size, inches	Capacity, inches	Price Each	Jaws per Set	Right and Left Hand Screw	Auxiliary Screw
1/2	0 to 1/2	\$ 8.00	\$ 2.50	\$1.00	\$0.40
3/4	0 to 3/4	9.00	2.75	1.00	.40
1	0 to 1	10.00	3.00	1.10	.50
1 1/4	1/2 to 1 1/4	15.00	4.50	1.75	.65
1 1/2	3/4 to 1 1/2	18.00	5.00	2.50	1.00
2	1 to 2	20.00	6.25	3.00	1.00
2 1/2	1 1/2 to 2 1/2	25.00	8.00	3.50	1.00
3	2 to 3	35.00	9.00	4.00	1.00
3 1/2	2 1/2 to 3 1/2	50.00	12.00	4.50	1.00
4	3 to 4	60.00	15.00	5.00	1.00

1/2, 3/4, 1 and 1 1/4 are for use with Arbor.

1 1/2, 2, 2 1/2, 3, 3 1/2 and 4 are for Face Plate.

THE GRAHAM CHUCK

With Blank Shanks; For Grooved Shank Drills



No.	Capacity, inches	Price Each
0	1/2 to 1 1/2	\$ 4.50
1	1/4 to 3/4	6.00
1 1/2	1 to 1 1/2	10.50
2	1 1/2 to 2 1/2	12.00

NATIONAL ROUND BODY TRIPLE GRIP DRILL CHUCK



Has three distinct grips (except Nos. 18 and 19), which can be applied at the same time or independently of each other. Workmanship and material like the very best.

No.	Drill Capacity, inches	Price Each	Screws	Jaws per Set
18	0 to 1/4	\$ 7.00	\$1.00	\$2.00
19	0 to 3/8	7.00	1.00	2.25
20	0 to 1/2	8.00	1.00	2.30
21	0 to 3/4	9.00	1.00	2.45
22	0 to 1	10.00	1.15	2.50
22 1/2	0 to 1	11.00	1.45	3.45
23	0 to 1 1/2	18.00	2.45	5.10
24	0 to 2	20.00	3.10	6.30

Nos. 23 and 24 fitted for Face Plate.

No. 22 1/2 is extra heavy for very hard service.

THE NATIONAL DRILL CHUCK



Simple, positive and powerful. An excellent Chuck for turret head work, being light in weight and very strong. Very best material and workmanship throughout. A positive drive, when desired, by flattening end of drill shank so it will enter positive drive slot in jaw screw.

No.	Holding Drill, inches	Price
8	0 to 1/2	\$ 5.00
9	0 to 3/8	5.50
10	0 to 1/2	6.50
11	0 to 3/4	7.50
12	0 to 1	10.00
13	0 to 1 1/2	16.00
14	0 to 2	18.00

Nos. 13 and 14 for Face Plate.

DRILL CHUCK ARBORS



For Blacksmith's Drill Press

1/2 or 3/4 inch Shank.....each, \$0.75

WITH TAPER SHANKS

Fitting No. 1 Morse Socket.....each, \$1.00	
Fitting No. 2 Morse Socket....." 1.00	
Fitting No. 3 Morse Socket....." 1.25	
Fitting No. 4 Morse Socket....." 1.50	
Fitting No. 5 Morse Socket....." 2.00	

In ordering, specify make and size of Chuck which Arbors are desired for.

STANDARD DRILL CHUCKS

Steel Body



No.	Diameter, inches	Capacity, inches	Price Each Without Arbors	Extra Jaws per Set	Extra Screws Each
00	1 3/8	0 to 1/4	\$ 6.00	\$1.75	\$1.00
0	1 1/2	0 to 3/8	6.50	2.00	1.00
1	2 1/8	0 to 1/2	7.00	2.25	1.00
2	2 7/8	0 to 3/4	8.00	2.50	1.10
3	3 1/8	0 to 1	10.00	2.75	1.25

GOODSELL DRILL CHUCKS



No.	Capacity, inches	Straight Shank 1/2 inch or 1/4	Morse Taper, No. 1 or No. 2
14	0 to 5/32	\$1.50	\$2.00
15	0 to 1/4	2.00	2.50
15 1/2	0 to 3/8	3.00	3.50
16	0 to 1/2	4.00	4.50

1/2 inch straight shank sent unless otherwise specified.

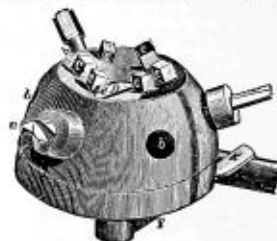
STAR DRILL CHUCKS



For holding round or square work. Jaws are of tool steel, carefully tempered. Well made and substantial, guaranteed to hold true and will not injure shank of drill.

No.	Capacity, inches	Diameter Shank, inches	Price Each
5	0 to 1/4	1/2 or 1/4	\$1.00
6	0 to 3/8	1/2 or 1/4	1.50
7	0 to 1/2	1/2 or 1/4	2.00

THE ALMOND TURRET HEAD TOOL



Lowers the cost and increases the accuracy of duplicate work by converting an ordinary lathe into a six tool turret lathe.

No.	Diameter, inches	Socket Holes, inches	Weight, pounds	Price Each
1	3 1/2	1/2 x 1	3 1/2	\$13.00
2	5 1/4	3/8 x 1 1/2	14	25.00

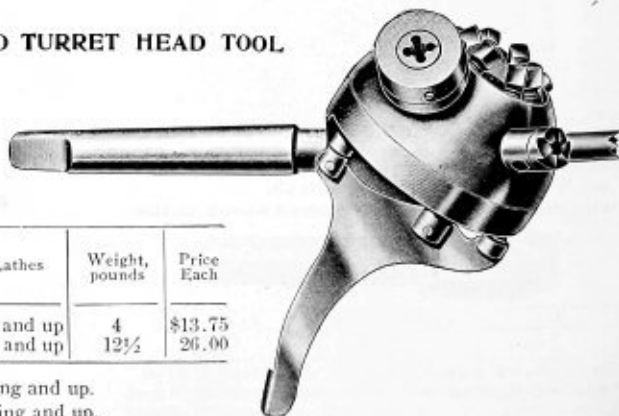
THE BAKER IMPROVED ALMOND TURRET HEAD TOOL

The tool holding cap piece is automatically released on the back stroke. Head has six holes for the reception of tools, which can be instantly brought into line with head of lathe and automatically locked while in use.

No.	Diameter, inches	TOOL HOLES		Suitable for Lathes	Weight, pounds	Price Each
		Diam. inches	Depth, inches			
1	3 1/2	1/2	1	9 inch swing and up	4	\$13.75
2	5 1/8	3/8	1 1/2	12 inch swing and up	12 1/2	26.00

No. 1 for Lathes 9 inch swing and up.

No. 2 for Lathes 12 inch swing and up.



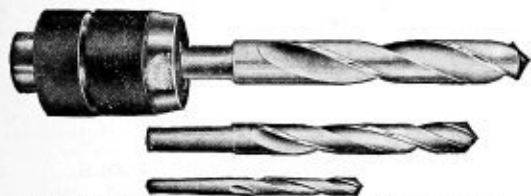
THE MORROW HAND OPERATED DRILL CHUCK

Self tightening; Ball Bearing Release



Nos. 2, 3, 4, 5
For Straight Shank Drills

Operated by hand without the use of key, spanner or wrench. All parts are perfectly aligned on plain bearings; has large ball bearing to take end thrust. The pressure from drill automatically tightens jaws which are easily released by hand through a differential screw arrangement. Drills run true from shank to point. No exposed threads to catch waste or collect dust. Jaws, bearings and hoods are of crucible steel, hardened and ground. Constructed to meet all the requirements of high speed tools, also for use on screw machines, automatics and all milling machines.



Nos. 3 1/2 and 5 for Taper Shank Tangless Drills

To Remove Bad End of Shank:

Saw off below the tang and round end off. The rounded end gives center thrust in chuck.

FOR STRAIGHT SHANK DRILLS			FOR TAPER SHANK TANGLESS DRILLS		
No.	Capacity	Price Each	No.	Capacity	Price Each
2	0— $\frac{5}{16}$	\$ 6.00	3 1/2	To Hold No. 1 Taper	\$ 9.00
3	0— $\frac{1}{2}$	9.00	5 1/2	To Hold Nos. 1, 2, 3 Tapers	25.00
4	$\frac{1}{4}$ — $\frac{3}{4}$	20.00			
5	$\frac{1}{2}$ —1	25.00			

THE DAVIS MILLING ATTACHMENT

With Compound Table

Has Circular Base for clamping to any Drill Press Table, with Dovetail Cross Slides, operated with Screws and Ball Cranks, by hand. Saddle is graduated and swivels to any angle. Table is slotted for clamping down work, Chuck or Vise. Handy for large shops, when the big machines are tied up, for spotting castings, milling off ends of bosses, etc.; for small shops that can not afford expensive machines; diemakers, locksmiths, patternmakers, repair men and automobile garages. It will cut key seats and mill cams. For use with end mill, fishtail cutter or formed cutters.



Diameter Base, inches	Dimensions Table, inches	Tee Slot, inches	Cross Feeds Each Way, inches	Net Weight, pounds	Price Each
12 1/2	6 1/4 x 12 1/2	1/2	8	90	\$60.00

ARMSTRONG TOOLS

STRAIGHT AND OFFSET TOOL HOLDERS



Complete with drop forged wrench and two self-hardening cutters, ground to shape. Can be furnished with right or left hand offset, or straight.

No.	Size of Holder, inches	Size of Cutter, in. square	Price Complete, Each	Extra Cutters, Each
00	$\frac{3}{8} \times \frac{5}{8} \times 1\frac{1}{2}$	$\frac{3}{16}$	\$ 1.60	\$0.10
0	$\frac{3}{8} \times \frac{3}{4} \times 5$	$\frac{1}{4}$	1.65	.12
1	$\frac{1}{2} \times 1 \times 6$	$\frac{1}{8}$	1.80	.18
2	$\frac{5}{8} \times 1\frac{1}{4} \times 7$	$\frac{3}{8}$	2.30	.25
3	$\frac{3}{4} \times 1\frac{1}{2} \times 8$	$\frac{7}{16}$	3.00	.35
4	$\frac{7}{8} \times 1\frac{3}{8} \times 9$	$\frac{1}{2}$	3.80	.45
5	$1 \times 1\frac{1}{4} \times 11$	$\frac{5}{8}$	4.75	.65
6	$1\frac{1}{4} \times 2 \times 13$	$\frac{3}{4}$	7.00	1.00
7	$1\frac{1}{2} \times 2\frac{1}{4} \times 16$	$\frac{7}{8}$	12.00	1.75
750	$1\frac{3}{8} \times 2\frac{1}{2} \times 18$	1	17.50	2.50
800	$1\frac{3}{4} \times 2\frac{3}{4} \times 20$	$1\frac{1}{8}$	23.00	3.25

Always state whether offset or straight tool is wanted.

STRAIGHT SHANK CUTTING-OFF TOOLS

Complete with Drop Forged Wrench and one Self-Hardening Steel Blade.



No.	Size Holder, inches	Size Cutter, inches	Price Each	Extra Blades, Price Each
20	$\frac{3}{8} \times 1 \times 5$	$\frac{3}{8} \times \frac{5}{8} \times 5\frac{1}{2}$	\$1.65	\$0.25
21	$\frac{1}{2} \times 1\frac{1}{8} \times 6$	$\frac{1}{8} \times \frac{3}{4} \times 6\frac{1}{2}$	1.80	.35
22	$\frac{5}{8} \times 1\frac{1}{8} \times 7$	$\frac{1}{8} \times \frac{7}{8} \times 7\frac{1}{2}$	2.30	.45
23	$\frac{3}{4} \times 1\frac{1}{2} \times 8$	$\frac{1}{8} \times 1 \times 8\frac{1}{2}$	3.00	.60
24	$\frac{7}{8} \times 1\frac{5}{8} \times 9$	$\frac{1}{8} \times 1\frac{1}{8} \times 9\frac{1}{2}$	3.80	.75
25	$1 \times 1\frac{1}{8} \times 10$	$\frac{1}{4} \times 1\frac{1}{4} \times 10\frac{1}{2}$	4.75	.95
26	$1\frac{1}{2} \times 2 \times 11$	$\frac{1}{4} \times 1\frac{3}{8} \times 11\frac{1}{2}$	6.50	1.25

OFF-SET CUTTING-OFF TOOLS

Right and Left Hand

Complete with Drop Forged Wrench and one Self-Hardening Steel Blade.



No. Left	No. Right	Size Shank, inches	Size Blade, inches	Price Complete	Extra Blades, Each
.....	00-C	$\frac{3}{8} \times \frac{3}{4}$	$\frac{3}{8} \times \frac{3}{8}$	\$1.65	\$0.25
30-L	30-R	$\frac{3}{8} \times 1$	$\frac{3}{8} \times \frac{5}{8}$	1.65	.25
31-L	31-R	$\frac{1}{2} \times 1\frac{1}{8}$	$\frac{1}{8} \times \frac{3}{4}$	1.80	.35
32-L	32-R	$\frac{5}{8} \times 1\frac{1}{8}$	$\frac{1}{8} \times \frac{7}{8}$	2.30	.45
33-L	33-R	$\frac{3}{4} \times 1\frac{1}{2}$	$\frac{1}{8} \times 1$	3.00	.60
34-L	34-R	$\frac{7}{8} \times 1\frac{5}{8}$	$\frac{1}{8} \times 1\frac{1}{8}$	3.80	.75
35-L	35-R	$1 \times 1\frac{1}{8}$	$\frac{1}{4} \times 1\frac{1}{4}$	4.75	.95
36-L	36-R	$1\frac{1}{2} \times 2$	$\frac{1}{4} \times 1\frac{3}{8}$	6.50	1.25

DROP HEAD TOOL HOLDERS

Especially designed for use on lathes with high slide rests or low centers. Its "goose neck" shape makes it an exceptionally efficient planer tool.



Complete with two Self-Hardening Steel Cutters and one Drop Forged Wrench.

No.	Size of Holder, inches	Size of Cutter, inches square	Height From Bottom Shank to Cutter Point, inches	Price Complete	Extra Cutters, Each
100	$\frac{1}{2} \times \frac{1}{4} \times 6$	$\frac{3}{16}$	$\frac{1}{2}$	\$ 1.75	\$0.10
101	$\frac{5}{8} \times \frac{3}{8} \times 7\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	2.00	.12
102	$\frac{7}{8} \times 1\frac{1}{8} \times 9\frac{1}{2}$	$\frac{3}{8}$	1	3.25	.25
103	$1\frac{1}{8} \times 1\frac{3}{8} \times 11\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{4}$	5.00	.45
104	$1\frac{3}{8} \times 1\frac{5}{8} \times 14\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{2}$	7.50	.65
105	$1\frac{5}{8} \times 1\frac{7}{8} \times 17\frac{1}{2}$	$\frac{3}{4}$	$1\frac{3}{4}$	12.00	1.00

Furnished Straight or with Right or Left Hand Off-set, always state which style is wanted.

STRAIGHT SHANK SIDE TOOLS

Right and Left Hand

Complete with Drop Forged Wrench and one Self-Hardening Steel Cutter, ground to shape.



No. Right or Left	Size Shank, inches	Size Cutter, inches	Price Complete	Extra Cutters, Each
81	$\frac{1}{4} \times 1\frac{1}{8} \times 6$	$\frac{3}{8} \times \frac{5}{8} \times 6$	\$ 2.40	\$0.55
82	$\frac{5}{8} \times 1\frac{1}{4} \times 6$	$\frac{1}{4} \times \frac{3}{4} \times 6\frac{1}{2}$	3.00	.65
83	$\frac{3}{4} \times 1\frac{1}{2} \times 7\frac{1}{2}$	$\frac{1}{8} \times 1 \times 8$	3.90	1.15
84	$1 \times 1\frac{3}{4} \times 9$	$\frac{3}{8} \times 1\frac{1}{4} \times 9\frac{1}{2}$	4.90	1.35
85	$1\frac{1}{8} \times 2 \times 11$	$\frac{1}{8} \times 1\frac{3}{8} \times 11\frac{1}{2}$	6.50	1.85
86	$1\frac{1}{2} \times 2\frac{1}{4} \times 13$	$\frac{1}{2} \times 1\frac{1}{2} \times 13\frac{1}{2}$	8.50	2.50
87	$1\frac{1}{2} \times 2\frac{3}{4} \times 15$	$\frac{3}{8} \times 1\frac{5}{8} \times 15\frac{1}{2}$	12.00	3.75

When ordering specify Right or Left hand.

OFF-SET SIDE TOOLS

Right and Left Hand

Complete with Drop Forged Wrench and one Self-Hardening Steel Cutter, ground to shape.



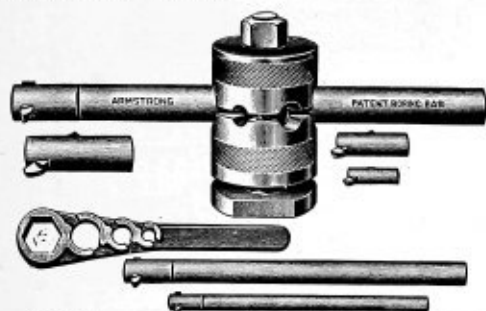
No. Right or Left	Size Shank, inches	Size Cutter, inches	Price Complete	Extra Cutters, Each
70	$\frac{3}{8} \times \frac{3}{8}$	$\frac{3}{8} \times \frac{5}{8} \times 4\frac{1}{2}$	\$2.20	\$0.45
71	$\frac{1}{2} \times 1\frac{1}{8}$	$\frac{1}{4} \times \frac{3}{4} \times 5$	2.40	.50
72	$\frac{5}{8} \times 1\frac{1}{8}$	$\frac{1}{8} \times 1 \times 6$	3.00	.75
73	$\frac{3}{4} \times 1\frac{1}{2}$	$\frac{1}{8} \times 1\frac{1}{4} \times 7$	3.90	1.15
74	$\frac{7}{8} \times 1\frac{5}{8}$	$\frac{1}{8} \times 1\frac{3}{8} \times 8$	4.90	1.35
75	$1 \times 2\frac{1}{8}$	$\frac{1}{2} \times 1\frac{1}{2} \times 9$	6.50	1.85
76	$1\frac{1}{4} \times 2\frac{1}{4}$	$\frac{3}{8} \times 1\frac{5}{8} \times 10$	8.50	2.50

When ordering specify Right or Left Hand.

ARMSTRONG TOOLS

THREE BAR BORING TOOL

Set consists of holder and three boring bars with straight and 45 degree end caps and cutters, a piece of each size steel for extra cutters and one wrench.



A slight turn of one nut releases or fastens both bar and holder.

Bars can be changed as needed instantly, allowing operator to use stiffest bar possible for each job with result that speeds and feeds are increased.

Only one wrench required.

No.	Diam. Bars inches	Length of Bars inches	Size of Cutters inches sq.	For Lathes Swing inches	Price Complete Set
1-B	1/2, 3/4, 1 1/4	8, 11, 16	1/8, 3/16, 1/4	14 to 16	\$12.00
2-B	1 1/2, 1 3/4, 2 1/4	9, 12, 18	3/8, 1/2, 5/8	16 to 18	15.00
3-B	1 3/4, 2 1/4, 3 1/4	11, 16, 21	1/2, 5/8, 3/4	20 to 22	21.00
4-B	2 1/2, 3 1/4, 4 1/4	13, 18, 24	3/4, 7/8, 1	24 to 32	28.00

ARMSTRONG BORING TOOLS

Each set consists of holder and bar with straight and 45 degree end caps, two cutters (ground for boring), and a double end wrench.



No.	Size Shank inches	Size Bar inches	Size Cutter inches	Price Complete	Extra Cutters Each
00B	5/8 x 5/8	1 1/2	3/8	\$ 3.00	\$ 0.12
8	1 1/8 x 1 1/8	2	1/2	3.00	.12
9	1 1/4 x 1 1/4	2 1/2	5/8	3.60	.15
10	1 3/8 x 1 3/8	3	3/4	4.75	.20
11	1 7/8 x 1 7/8	3 1/2	7/8	6.75	.30
12	2 x 2	4	1	10.00	.40
13	2 1/4 x 2 1/4	5	1 1/8	14.00	.50

BORING TOOLS—WITHOUT SHANK

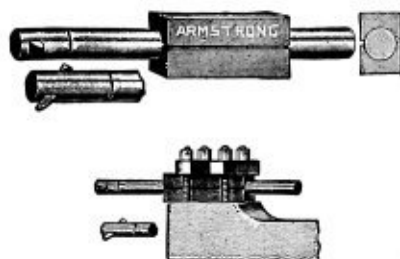
We are prepared to furnish extra bars with bushings, to fit same to shanks of larger size. These extra bars are equipped with wrench, caps, etc., making complete tools with exception of shank; includes bar with straight and 45 degree end caps, two cutters (ground for boring), wrench and one bushing.

No.	Size Bar inches	Bushing for Shank No.	Price Each
0B	1/2	8, 9, 10	\$1.75
08	5/8	9, 10, 11	1.75
09	3/4	10, 11, 12	2.25
010	7/8	11, 12, 13	3.25
011	1 1/8	12, 13	4.50
012	1 1/4	13	6.25

NOTE—In ordering be careful to give size of shank (or number of tool) in which bar is to be used.

BORING TOOLS

For use in large lathes with clamp tool rest. Consists of shank and bar with straight and 45 degree end caps, two cutters and double end wrench.



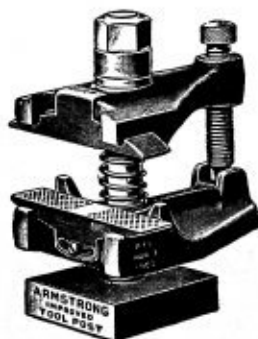
No.	Size Shank inches	Diameter Bar inches	Length Bar inches	Size Cutter in. sq.	Price Complete	Extra Cutters Ground for Boring Each
15	1 1/4 x 2 1/4	1 1/2	18	3/8	\$ 8.75	\$0.40
16	1 3/4 x 2 3/4	1 3/4	22	1/2	10.50	.50
17	2 1/4 x 2 3/4	1 1/2	24	5/8	13.75	.70

IMPROVED LATHE TOOL POST

It is stronger and stiffer than the ordinary tool post, will not slip or chatter and consequently it will do more accurate work. As there is no side projection, it is peculiarly adapted for working close up to the chuck.

It has a great range of adjustment without loss of holding power as the rocker jaws adjust themselves on parallel lines.

The open side design permits rapid and convenient change and adjustment of tools.



No.	For Tools	For Lathes	Price, Each
1-T	5/8 x 1 inch and less	12 to 14 inch Swing	\$ 5.50
2-T	5/8 x 1 1/4 and 3/4 x 1 1/2 inch	16 to 18 inch Swing	7.00
3-T	3/4 x 1 1/2 and 1 x 1 1/2 inch	20 to 22 inch Swing	9.00
4-T	3/4 x 1 1/2 and 1 x 1 1/4 inch	24 to 32 inch Swing	12.00

ARMSTRONG TOOLS

THREADING TOOLS

Point is absolutely accurate in shape and angle, insuring perfect fitting threads. Simplicity, strength and permanence of adjustment, make it an excellent tool.



No.	Size of Shank, inches	Price Complete with V or U. S. Std #1 yd Cutter	Price Complete with White- worth Cutter
00T	$\frac{1}{8}$ x $\frac{5}{8}$ x 5	\$2.25	\$2.50
50	$\frac{1}{8}$ x $\frac{3}{4}$ x 5	2.25	2.50
51	$\frac{1}{4}$ x 1 x 6	2.75	3.10
52	$\frac{5}{8}$ x 1 $\frac{1}{4}$ x 7	3.50	4.00
53	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 8	4.50	5.00
54	$\frac{7}{8}$ x 1 $\frac{5}{8}$ x 9	5.50	6.00
55	1x 1 $\frac{3}{4}$ x 10	7.00	7.70

PRICE LIST OF CUTTERS FOR THREADS

For Tool No.	00T and 50		51		52		53 and 54		55
Shape of Thread	Single Point	Chaser	Single Point	Chaser	Single Point	Chaser	Single Point	Chaser	Single Point Only
Sharp V...	\$0.45	\$0.90	\$0.55	\$1.05	\$0.70	\$1.20	\$0.90	\$1.50	\$1.25
U. S. S. R'd	.50	.90	.60	1.05	.75	1.20	.95	1.50	1.35
Whitworth	.55	1.25	.90	1.40	1.15	1.85	1.40	1.80	1.95

NOTE—In ordering tools with U. S. or Whitworth cutters specify number of threads per inch wanted. Tools with single point Sharp V cutter will be shipped unless otherwise specified.

LIST OF CUTTERS FURNISHED

We can furnish single point and chasing cutters to cut pitches listed beneath in Sharp V, Whitworth and U. S. Standards.

Single Point Cutters	No. 60T and 50, all standard pitches, 6 to 20 inclusive
"	51, " " " 5 " 20 "
"	52, " " " 4 " 20 "
"	53, 54 and 55, " " " 3 " 20 "
Chaser Cutters	No. 60T and 50, 14, 16 18, 20, 24*
"	51, 11½", 12, 13, 14, 16, 18, 20, 24*
"	52, 8, 10, 11, 11½", 12, 13, 14, 16, 18, 20
"	53 and 54, 8, 10, 11, 11½", 12, 13, 14, 16, 18, 20

*Y Thread only

Note—When ordering cutters for U. S. or Whitworth standard, specify exact pitch or number of threads per inch.

ARMSTRONG BOLT DRIVER

This is an extremely handy lathe attachment for turning square, flat or Hexagon stock, especially when a number of pieces the same size are to be turned, as no adjustment, tightening or loosening is necessary when changing pieces.



Price List

No.	Capacity, inches	Price Each
2-D	2	\$2.75
3-D	3	4.00
4-D	4	6.00

PLANER TOOL



Complete with drop forged wrench and two self hardening steel cutters ground to shape.

No.	Size Shank, inches	Length, inches	Size Cutter, inches	Price Complete	Extra Cutters Each
40	$\frac{1}{2} \times 1$	7	$\frac{1}{4} \times \frac{3}{8}$	\$ 2.75	\$0.20
401	$\frac{5}{8} \times 1\frac{1}{2}$	$8\frac{1}{2}$	$\frac{3}{8} \times \frac{1}{2}$	3.50	.30
41	$\frac{3}{4} \times 1\frac{1}{2}$	10	$\frac{3}{8} \times \frac{1}{2}$	4.50	.40
42	$1\frac{1}{8} \times 1\frac{3}{4}$	13	$\frac{1}{2} \times \frac{3}{4}$	7.00	.70
43	$1\frac{3}{8} \times 2$	16	$\frac{5}{8} \times \frac{7}{8}$	11.00	1.00
44	$1\frac{7}{8} \times 2\frac{1}{4}$	20	$\frac{3}{4} \times 1$	16.00	2.00
45	$2\frac{1}{8} \times 2\frac{3}{4}$	24	$\frac{7}{8} \times 1\frac{1}{8}$	25.00	3.00

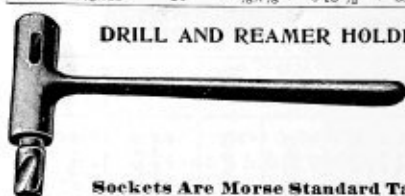
GANG PLANER TOOL

With this tool planer will carry with ease a feed and depth of cut much greater than with the ordinary tool. Complete with one set self hardening steel cutters gauge for grinding and wrench.



No.	Size Shank, inches	Length Over All, inches	Size Cutter, inches	Feed Adj'stm't, inches	Price Complete	Extra Cutters Each
61	1 $\frac{1}{4}$ x1 $\frac{1}{2}$ x7 $\frac{1}{2}$	10	$\frac{3}{8}$ x $\frac{1}{2}$	0 to $\frac{1}{4}$	\$12.00	\$0.35
62	1 $\frac{3}{8}$ x2 $\frac{3}{4}$ x9	12	$\frac{1}{2}$ x $\frac{1}{2}$	0 to $\frac{3}{8}$	20.00	.60
63	2 x2 $\frac{3}{4}$ x11	14	$\frac{5}{8}$ x $\frac{1}{2}$	0 to $\frac{3}{8}$	35.00	1.00

DRILL AND REAMER HOLDERS



Sockets Are Morse Standard Taper

No.	Holds Drills, inches	WEIGHT		Price
		Lbs.	Oz.	
1	14 to 13	1	12	\$0.90
2	12 to 11	2	9	1.20
3	11 to 10	4	3	1.60
4	10 to 9	7	8	2.60
5	9 to 8	14	8	4.00

ARMSTRONG CLAMP DRILL HOLDER



Straight Shank Drills

No.	Capacity, inches	Length, inches	Price Each
200	$\frac{1}{4}$ to 1	11	\$1.20
300	$\frac{3}{8}$ to $1\frac{1}{2}$	13	1.60
400	$\frac{1}{2}$ to 2	$15\frac{1}{2}$	2.00
500	$\frac{3}{4}$ to 3	18	4.00

LATHE TOOL SETS AND CABINETS

Made in Six Sizes. Strong, Practical and Convenient for Lathe Tool Sets and Extra Cutters






	Price List	Cabinet and Stand	Tools Only	Cabinet, Stand and Tools
No. 0	For use on Lathes 10 to 12 inch swing. Tool Shanks $\frac{3}{4} \times \frac{3}{4}$ inch. Cabinet, 13x20 inches. Height (on stand) floor to top, 34 inches. Weight of Cabinet and stand, 52 lbs. Weight of Tools, 9 1/2 lbs.	\$18.00	\$19.50	\$37.00
No. 1	Tools for use on Lathes 14 to 16 inch swing. Tool Shanks $1 \frac{1}{2} \times 1$ inch. Cabinet, 15x22 inches. Height (on stand) floor to top, 34 inches. Weight of Cabinet and stand, 64 lbs. Weight of Tools, 16 1/2 lbs.	21.00	21.95	42.00
No. 2	Tools for use on Lathes 16 to 18 inch swing. Tool Shanks, $\frac{5}{8} \times 1 \frac{1}{4}$ inches. Cabinet, 17x24 inches. Height (on stand) floor to top, 34 inches. Weight of Tools, 28 1/2 lbs.	24.00	28.05	51.00
No. 3	Tools for use on Lathes 18 to 20 inch swing. Tool shanks, $\frac{3}{4} \times 1 \frac{1}{2}$ inch. Cabinet, 20x27 inches. Cabinet (on stand) floor to top, 34 inches. Weight of Cabinet and stand, 119 lbs. Weight of Tools, 44 lbs.	27.00	37.05	63.00
No. 4	Tools for use on Lathes 24 to 36 inch swing. Tool shanks, $\frac{7}{8} \times 1 \frac{3}{4}$ inch. Cabinet, 23x30 inches. Height (on stand) floor to top, 34 inches. Weight of Cabinet and stand, 167 lbs. Weight of Tools, 65 lbs.	30.00	48.10	77.00
No. 5	Tools for use on Lathes 36 to 48 inch swing. Tool Shanks, $1 \frac{1}{2} \times \frac{3}{4}$ inch. Cabinet 26x33 inches. Height (on stand) floor to top, 34 inches. Weight of Cabinet and stand, 197 lbs. Weight of Tools, 94 lbs.	33.00	62.25	94.00

NOTE.—Swing of Lathes given is only approximate. Tool posts should be carefully measured before ordering tools.

Armstrong Special Self-Hardening Steel

For high speeds and heavy feeds. For use in tool holders. In three-foot bars only.

SQUARES	Size, inches Square	Price Per Bar	Size, inches Square	Price Per Bar
 For use in Armstrong Turning and Boring Tools.	$\frac{3}{4}$	\$0.50	$\frac{5}{8}$	\$3.00
	$\frac{1}{2}$	.60	$\frac{3}{4}$	4.50
	$\frac{3}{8}$	.85	$\frac{1}{2}$	5.75
	$\frac{1}{4}$	1.20	$\frac{3}{8}$	7.60
	$\frac{3}{16}$	1.65	$\frac{1}{4}$	9.00
	$\frac{1}{8}$	2.10		
FLATS	Size, inches	Price Per Bar	Size, inches	Price Per Bar
 For use in Armstrong Planer and Slotter Tools.	$\frac{1}{2} \times \frac{1}{4}$	\$0.85	$\frac{1}{2} \times \frac{1}{2}$	\$3.00
	$\frac{3}{8} \times \frac{1}{4}$	1.20	$\frac{3}{8} \times \frac{1}{2}$	3.40
	$\frac{1}{4} \times \frac{1}{4}$	1.60	$\frac{1}{4} \times \frac{1}{2}$	4.20
	$\frac{3}{16} \times \frac{1}{4}$	2.10	$\frac{3}{16} \times \frac{1}{2}$	5.75
	$\frac{1}{8} \times \frac{1}{4}$	2.75	$\frac{1}{8} \times \frac{1}{2}$	7.50
Special Bevel	Size of Steel, inches	For Tools	Price Per Bar	
 For use in Armstrong Cut- ting-Off Tools	$\frac{3}{8} \times \frac{1}{2}$	No. 20 and 30	\$0.75	
	$\frac{1}{2} \times \frac{1}{2}$	" 21 " 31	.80	
	$\frac{3}{4} \times \frac{1}{2}$	" 22 " 32	1.00	
	$\frac{1}{2} \times 1$	" 23 " 33	1.60	
	$\frac{3}{4} \times 1$	" 24 " 34	2.00	
	$\frac{1}{2} \times 1 \frac{1}{2}$	" 25 " 35	2.75	
	$\frac{3}{4} \times 1 \frac{1}{2}$	" 26 " 36	3.10	

Special Shape	Size of Steel On lines AA and BB, inches	For Tools	Price Per Bar
For use in Armstrong Side Tools.	$\frac{1}{2} \times \frac{3}{4}$	No. 70	\$1.50
	$\frac{3}{8} \times \frac{3}{4}$	" 71 and 82	2.00
	$\frac{1}{4} \times 1$	" 72 " 83	2.75
	$\frac{3}{8} \times 1$	" 73 " 84	3.75
	$\frac{1}{2} \times 1 \frac{1}{4}$	" 74 " 85	4.75
	$\frac{3}{4} \times 1 \frac{1}{4}$	" 75 " 86	5.75
	$\frac{1}{2} \times 1 \frac{1}{2}$	" 76 " 87	6.75

NOTE.—Steel for Side Tools and Cutting-Off Tools is rolled to approximate width, but requires grinding on edges to bring to exact size.

ARMSTRONG SLOTTER TOOLS

Complete with Drop Forged Wrench and two Self-Hardening Steel Cutters.



Very stiff and easily adjustable to different lengths of stroke. Point can be projected beyond the end of the bar. Spring relief block saves cutter from wear and tear of return stroke. Clamps and bolt heads are of ample size to allow for fitting to slots of any machine.

No.	For Slotter, inches	Diam of Bar	Length Over All, inches	Size Cutter, inches	Weight lbs.	Price, Complete	Extra Cutters
91	6 and 8	1 1/2	16	$\frac{1}{2} \times \frac{3}{4}$	30	\$20.00	\$0.50
92	10 " 12	2	22	$\frac{3}{8} \times \frac{1}{2}$	45	30.00	.65
93	14 " 16	2 1/4	27	$\frac{1}{4} \times \frac{3}{4}$	65	45.00	.85
94	18 " 20	2 1/2	32	$\frac{3}{8} \times \frac{7}{8}$	95	65.00	1.15
95	22 " 24	2 3/4	37	$\frac{1}{2} \times 1$	135	95.00	2.00

ARMSTRONG NEW PLANER JACKS

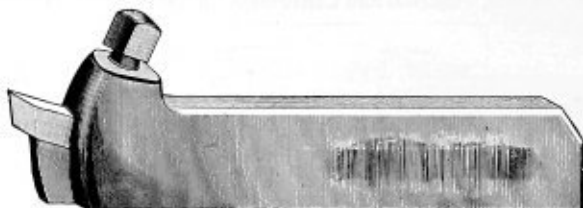
Handy—Substantial—Convenient

For leveling work on Planers Milling Machines, etc. Perfectly adjustable and solid, insuring true surfaced work. Bottom and tilting cap are faced true and smooth. Jack screw can be locked in position, and when locked cannot be jarred down.



No.	Height Contracted, inches	Height Extended, inches	Weight, pounds	Price Each
1	2 1/4	3 1/4	1 1/4	\$1.00
2	3 1/4	5 1/4	3 1/2	1.50
3	5 1/4	7 1/2	6	2.00
4	7 1/2	12	12 1/2	3.00

CHAMPION STRAIGHT AND OFFSET TOOL HOLDER



Will not break taking heavy cuts on rapid work, because, with the support, under cutting edge of tool holder will not mash down under the continual strain of cutting. Cutters can be used up close to the shoulder, thus effecting a saving in expensive steels, while the shape of the head allows use of large cutters. Points of screws are hardened and extra large.

No. Straight	No. Right Hand	No. Left Hand	Size Holder, Straight	Size Holder, R. & L. Hand	Size of Cutters	Price, Each	Cutters Extra
0	15	30	$\frac{3}{8}$ x $\frac{3}{4}$ x 5	$\frac{3}{8}$ x $\frac{3}{4}$ x 7	$\frac{1}{4}$ inch square	\$ 1.65	\$0.12
1	16	31	$\frac{1}{2}$ x 1 x 6	$\frac{1}{2}$ x 1 x 8	$\frac{1}{8}$ " "	1.80	.18
2	17	32	$\frac{5}{8}$ x $1\frac{1}{4}$ x 7	$\frac{5}{8}$ x $1\frac{1}{4}$ x 9	$\frac{3}{8}$ " "	2.30	.25
3	18	33	$\frac{3}{4}$ x $1\frac{1}{2}$ x 8	$\frac{3}{4}$ x $1\frac{1}{2}$ x 10	$\frac{1}{2}$ " "	3.00	.35
4	19	34	$\frac{7}{8}$ x $1\frac{5}{8}$ x 9	$\frac{7}{8}$ x $1\frac{5}{8}$ x 11	$\frac{1}{2}$ " "	3.80	.45
5	20	35	1 x $1\frac{3}{4}$ x 10	1 x $1\frac{3}{4}$ x 12	$\frac{5}{8}$ " "	4.75	.65
6	21	36	$1\frac{1}{4}$ x 2 x 12	$1\frac{1}{4}$ x 2 x 14	$\frac{3}{4}$ " "	7.00	1.00
7	22	37	$1\frac{1}{2}$ x $2\frac{1}{4}$ x 14	$1\frac{1}{2}$ x $2\frac{1}{4}$ x 16	$\frac{3}{8}$ " "	12.00	1.75
8	23	38	2 x $2\frac{1}{2}$ x 16	2 x $2\frac{1}{2}$ x 18	1 " "	17.50	2.50
9	24	39	$2\frac{1}{2}$ x 3 x 18	$2\frac{1}{2}$ x 3 x 21	$1\frac{1}{4}$ " "	25.00	3.75
10	25	40	3 x $3\frac{1}{2}$ x 20	3 x $3\frac{1}{2}$ x 24	$1\frac{1}{2}$ " "	35.00	5.25

Each tool packed in a neat cardboard box, price including drop forged wrench and two cutters. Always specify whether straight, right or left hand tool is wanted.

CHAMPION STRAIGHT AND OFFSET CUTTING-OFF TOOL

STRAIGHT TOOL



Plenty of material in stock, where bearing down strain comes; clamp is V or wedged shape, arranged to shift backward or forward, allowing blades of different sizes to be used. Tool cuts right up to the shoulder. Blades are self-hardened steel and beveled to give proper clearance.

Price, Including Drop Forged Wrench and One Blade

No.	Size of Holder	Size of Blade	Price Complete	Extra Blade
60	$\frac{3}{8}$ x $\frac{3}{4}$ x 5	$\frac{3}{8}$ x $\frac{1}{2}$ x 5	\$1.65	\$0.25
61	$\frac{1}{2}$ x 1 x 6	$\frac{1}{2}$ x $\frac{5}{8}$ x 6	1.80	.35
62	$\frac{5}{8}$ x $1\frac{1}{4}$ x 7	$\frac{5}{8}$ x $\frac{7}{8}$ x 7	2.30	.45
63	$\frac{3}{4}$ x $1\frac{1}{2}$ x 8	$\frac{3}{4}$ x 1 x 8	3.00	.60
64	$\frac{7}{8}$ x $1\frac{5}{8}$ x 9	$\frac{7}{8}$ x $1\frac{1}{8}$ x 9	3.80	.75
65	1 x $1\frac{3}{4}$ x 10	$\frac{1}{4}$ x $1\frac{1}{4}$ x 10	4.75	.95
66	$1\frac{1}{4}$ x 2 x 11	$\frac{1}{4}$ x $1\frac{3}{8}$ x $11\frac{1}{2}$	6.50	1.25

RIGHT HAND TOOL



Furnished Right or Left Hand
Right Hand Tool Cutter Faces Head Stock
Left Hand Tool Cutter Faces Tail Stock

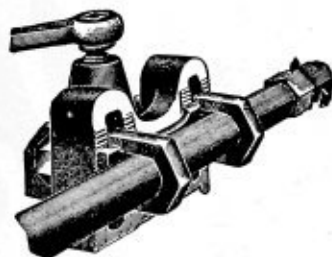
Plenty of material, giving all the strength required. Blade is held firmly in position by a V-shaped overlapping clamp. Blades are self hardening steel and beveled to give proper clearance.

Price, Including Drop Forged Wrench and One Blade

No. R. H.	No. L. H.	Size of Holder	Size of Blade	Price Complete	Extra Blade
70	70	$\frac{3}{8}$ x $\frac{3}{4}$ x 5	$\frac{3}{8}$ x $\frac{1}{2}$ x 5	\$1.65	\$0.25
71	71	$\frac{1}{2}$ x 1 x 6	$\frac{1}{2}$ x $\frac{5}{8}$ x 6	1.80	.35
72	72	$\frac{5}{8}$ x $1\frac{1}{4}$ x 7	$\frac{5}{8}$ x $\frac{7}{8}$ x 7	2.30	.45
73	73	$\frac{3}{4}$ x $1\frac{1}{2}$ x 8	$\frac{3}{4}$ x 1 x 8	3.00	.60
74	74	$\frac{7}{8}$ x $1\frac{5}{8}$ x 9	$\frac{7}{8}$ x $1\frac{1}{8}$ x 9	4.80	.75
75	75	1 x $1\frac{3}{4}$ x 10	$\frac{1}{4}$ x $1\frac{1}{4}$ x 10	4.75	.95
76	76	$1\frac{1}{4}$ x 2 x 11	$\frac{1}{4}$ x $1\frac{3}{8}$ x 11	6.50	1.25

BORING AND PLANER TOOLS

WESTERN BORING TOOL



Will hold range of bars shown below without extra Collets or Blockings. Light in weight; easy adjustment; fits the ordinary tool post; holds flat or rectangular bars, drills, reamers, etc. Cutters can be shifted from straight to 45° angle. Tool consists of holder, one bar with inserted cutter, two cutters and drop forged wrench.

No.	Size Shank, inches	Size Bar, inches	Range of Bars, inches	Size Cutter, inches	Price
140	$\frac{3}{8} \times 1\frac{3}{4}$	$\frac{5}{8} \times 12$	$\frac{1}{8}$ to $\frac{5}{8}$	$\frac{1}{4}$	\$ 3.75
141	$\frac{1}{2} \times 1\frac{3}{4}$	$\frac{7}{8} \times 14$	$\frac{1}{4}$ to $\frac{7}{8}$	$\frac{3}{8}$	4.40
142	$\frac{5}{8} \times 2$	$1\frac{1}{8} \times 16$	$\frac{1}{2}$ to $1\frac{1}{8}$	$\frac{1}{2}$	5.25
143	$\frac{3}{4} \times 2\frac{1}{4}$	$1\frac{1}{4} \times 18$	$\frac{3}{8}$ to $1\frac{1}{4}$	$\frac{3}{4}$	7.45
144	$\frac{7}{8} \times 2\frac{3}{8}$	$1\frac{1}{2} \times 20$	$\frac{1}{2}$ to $1\frac{1}{2}$	$\frac{1}{2}$	10.00
145	$1 \times 2\frac{1}{2}$	$1\frac{3}{4} \times 24$	$\frac{1}{2}$ to $1\frac{3}{4}$	$\frac{3}{8}$	14.00

Extra Bars with Two Cutters and Drop Forged Wrench

Size Bar, inches	Size Cutter, inches sq.	Price	Size Bar, inches	Size Cutter, inches sq.	Price
$\frac{1}{2} \times 10$	$\frac{1}{8}$	\$1.75	$1\frac{1}{4} \times 16$	$\frac{3}{8}$	\$3.00
$\frac{5}{8} \times 12$	$\frac{1}{4}$	2.00	$1\frac{1}{4} \times 18$	$\frac{1}{2}$	3.50
$\frac{3}{4} \times 13$	$\frac{1}{4}$	2.25	$1\frac{1}{2} \times 20$	$\frac{1}{2}$	4.50
$\frac{7}{8} \times 14$	$\frac{1}{8}$	2.50	$1\frac{3}{4} \times 24$	$\frac{5}{8}$	7.00
1×15	$\frac{3}{8}$	2.75			

CHAMPION BORING TOOL



Easily handled, quick of adjustment and light in weight. Will hold various sizes and shapes of bars, drills, reamers and square stock. Round steel holders always sent unless otherwise ordered.

Price, including Bar and Drop Forged Wrench

No.	Size of Holder	Size of Forged Steel Bar	Price	Extra Cutters
180	$\frac{3}{8} \times \frac{3}{4} \times 4$	$\frac{3}{8} \times 4$	\$1.65	\$0.50
181	$\frac{1}{2} \times 1 \times 5$	$\frac{1}{2} \times 5$	1.80	.60
182	$\frac{5}{8} \times 1\frac{1}{4} \times 6$	$\frac{5}{8} \times 6$	2.30	.70
183	$\frac{3}{4} \times 1\frac{1}{2} \times 7$	$\frac{3}{4} \times 7$	3.00	.80

CHAMPION PLANER TOOL

For use on Planer or Shaper



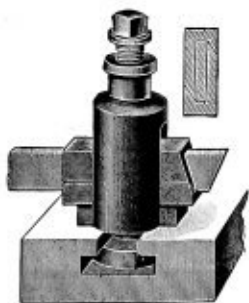
Drop-forged with cutter of high grade self-hardening steel. Cutters can be shifted to any angle, either right or left hand and are held firmly in position. Rectangular steel furnished if desired at the same price.

Price List, including Two Self-hardening Steel Cutters and Wrench

No.	Size of Shank, inches	Size of Cutter, inches square	Price	Extra Cutters
100	$\frac{1}{2} \times 1 \times 8$	$\frac{1}{8}$	\$ 2.75	\$0.22
101	$\frac{5}{8} \times 1\frac{1}{4} \times 9$	$\frac{3}{8}$	3.50	.30
102	$\frac{3}{4} \times 1\frac{3}{8} \times 10$	$\frac{1}{2}$	5.25	.40
103	$\frac{7}{8} \times 1\frac{1}{2} \times 11$	$\frac{1}{2}$	6.00	.50
104	$1 \times 1\frac{3}{8} \times 12$	$\frac{3}{8}$	7.00	.75
105	$1\frac{1}{2} \times 2 \times 15$	$\frac{3}{4}$	11.00	1.25
106	$2 \times 2\frac{1}{4} \times 20$	$\frac{7}{8}$	16.00	1.50
107	$2\frac{1}{4} \times 2\frac{3}{4} \times 24$	$1\frac{1}{4}$	25.00	3.00
108	$3 \times 3 \times 30$	$1\frac{1}{2}$	35.00	4.75

CHAMPION SCREW MACHINE

Straight Cutting-Off Tool

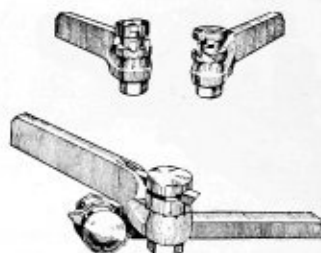
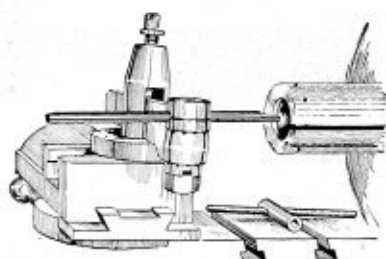


Blades are of self-hardening steel and double beveled, affording ample clearance. Cutter, being wedged is jammed into the holder from above and below and both sides. Different size blades are firmly held. Fully warranted in every respect.

No.	Size Holder	Size Cutter	Price	Extra Blades
300	$\frac{3}{4} \times \frac{7}{8} \times 2\frac{1}{2}$	$\frac{3}{8} \times \frac{1}{2} \times 5$	\$1.65	\$0.25
301	$\frac{1}{2} \times 1\frac{1}{8} \times 3$	$\frac{1}{8} \times \frac{5}{8} \times 6$	1.80	.35
302	$\frac{5}{8} \times 1\frac{1}{4} \times 3\frac{1}{2}$	$\frac{1}{4} \times \frac{3}{4} \times 7$	2.30	.45
303	$\frac{3}{4} \times 1\frac{1}{2} \times 4$	$\frac{1}{4} \times \frac{7}{8} \times 8$	3.00	.60

CHAMPION COMBINATION TOOL HOLDER

For Turning, Boring, Cutting-off and Threading

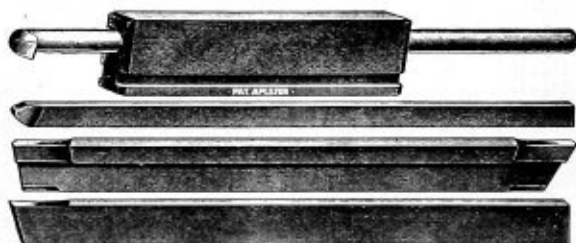


Drop-forged with cutters of self-hardening steel. Cutters can be shifted to any angle by simply loosening clamping nut. Can also be used as a cutting-off tool. Made in one size, $\frac{3}{8}$ x1 $\frac{1}{4}$.

- 201.** Drop-head tool with two square cutters.....**\$3.50**
201A. Drop-head tool with two square cutters and cutting-off blade..... **4.00**
201B. Drop-head tool two square cutters, cutting-off blade and boring bar..... **5.50**
201C. Drop-head tool two square cutters, cutting-off blade, boring bar and keyseating bar.... **7.50**

TAIT'S "UNIVERSAL" TOOL HOLDER

For Holding Round, Square, Cut-off and Side Tool Blades



Can be used for turning, planing, threading, boring, slotting or cutting-off in lathe, shaper, planer, slotter, screw machine and cutting-off machine. Will take steel of any shape. Is simple in construction, durable and can be used in any place where forged tools are used. Fully warranted.

No.	Size, Holder	Dimensions, Round or Square Blade	Dimensions, Cut-off Blade	Dimensions, Side Tool Blade	Price of Holder	Length, Extra Blade, inches	Price, Extra Blade, Each
1	$\frac{1}{4}$ x $\frac{1}{2}$ x 4	$\frac{1}{8}$	$\frac{3}{4}$ x $\frac{1}{2}$	$\frac{1}{8}$ x $\frac{1}{2}$	\$ 2.00	8	\$ 0.50
2	$\frac{3}{8}$ x $\frac{3}{4}$ x 4 $\frac{1}{2}$	$\frac{3}{16}$	$\frac{1}{2}$ x $\frac{1}{2}$	$\frac{1}{8}$ x $\frac{1}{2}$	2.15	9	.50
3	$\frac{1}{2}$ x $\frac{7}{8}$ x 5	$\frac{1}{4}$	$\frac{1}{2}$ x $\frac{5}{8}$	$\frac{1}{4}$ x $\frac{3}{8}$	2.25	10	.50
4	$\frac{1}{2}$ x1 x 5 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$ x $\frac{3}{4}$	$\frac{1}{8}$ x $\frac{3}{4}$	2.50	12	.75
5	$\frac{5}{8}$ x1 $\frac{1}{4}$ x 6	$\frac{3}{8}$	$\frac{1}{2}$ x $\frac{3}{4}$	$\frac{1}{8}$ x $\frac{3}{4}$	2.85	12	1.25
6	$\frac{3}{4}$ x1 $\frac{1}{2}$ x 7	$\frac{1}{2}$	$\frac{3}{4}$ x $\frac{7}{8}$	$\frac{3}{8}$ x $\frac{7}{8}$	3.80	14	2.00
7	1 x2 x 8	$\frac{5}{8}$	$\frac{1}{4}$ x1 $\frac{1}{4}$	$\frac{3}{8}$ x1 $\frac{1}{2}$	7.50	16	3.00
8	1 $\frac{1}{8}$ x2 x10	$\frac{3}{4}$	$\frac{1}{4}$ x1 $\frac{3}{8}$	$\frac{3}{8}$ x1 $\frac{3}{8}$	10.00	20	5.00
9	1 $\frac{1}{4}$ x2 x12	$\frac{7}{8}$	$\frac{1}{4}$ x1 $\frac{3}{8}$	$\frac{3}{8}$ x1 $\frac{3}{8}$	15.00	24	7.00
10	1 $\frac{1}{2}$ x2 $\frac{3}{4}$ x15	1	$\frac{1}{4}$ x1 $\frac{3}{8}$	$\frac{1}{2}$ x1 $\frac{3}{8}$	20.00	24	10.00
11	1 $\frac{3}{4}$ x2 $\frac{1}{4}$ x18	1 $\frac{1}{8}$	$\frac{1}{4}$ x1 $\frac{3}{8}$	$\frac{1}{2}$ x1 $\frac{3}{8}$	25.00	24	12.50

LATHE TOOLS

Hand Forged from High Grade Tool Steel



1. Left Side Tool.
2. Right Side Tool.
3. Left Side Tool, Bent.
4. Right Side Tool, Bent.
5. Heavy Diamond Point.
6. Diamond Point, Bent.
7. Diamond, Right Hand.
8. Diamond, Left Hand.
9. Half Diamond Point.
10. Round Nose.
11. Water Finish Tool.
12. Forming Tool.

13. Grooving or Shoulder Tool.
14. Centering Tool.
15. Die Tool.
16. Cutting-off Tool.
17. Cutting-off Tool, Bent.
18. Brass Tool.
19. Thread Tool.
20. Bent Thread Tool.
21. Spring Tool.
22. Inside Boring Tool.
23. Inside Thread Tool.

Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
$\frac{1}{4} \times \frac{1}{2}$	4 $\frac{1}{2}$	\$0.25	$\frac{5}{8} \times 1\frac{1}{4}$	9	\$0.85
$\frac{1}{8} \times \frac{5}{8}$	4 $\frac{3}{4}$	.30	$\frac{3}{4} \times 1\frac{1}{2}$	12	1.75
$\frac{3}{8} \times \frac{3}{4}$	5	.35	1 x 2	14	3.00
$\frac{1}{2} \times 1$	7	.50			

PLANER AND SHAPER TOOLS—Hand Forged



Size, inches	Length, inches	Price Each
$\frac{1}{2} \times 1$	7	\$0.60
$\frac{5}{8} \times 1\frac{1}{4}$	9	1.00
$\frac{3}{4} \times 1\frac{1}{2}$	12	2.00
1 x 2	14	3.25

51, Left side tool; 52, right side tool; 53, right hand diamond point; 54, left hand diamond point; 55, right half diamond point; 56, left half diamond point; 57, grooving tool; 58, finishing tool for cast iron; 59, finishing tool for steel; 60, spring tool; 61, cut-off tool; 62, cutting-down tool; 63, right siding tool; 64, left siding tool; 65, round nose tool; 66, right hand bevel tool; 67, left hand bevel tool.

HIGH SPEED TOOLS FOR TOOL HOLDERS

Square Tools



Flat Tools



41, Right hand roughing tool; 42, left hand roughing tool; 43, right hand diamond point; 44, left hand diamond point; 45, straight thread; 46, bent thread; 47, cutting-off tool.

SQUARE TOOLS			FLAT TOOLS		
Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
$\frac{3}{16}$	1 $\frac{1}{2}$	\$0.15	$\frac{1}{4} \times \frac{1}{2}$	4 $\frac{1}{2}$	\$0.50
$\frac{1}{4}$	2	.18	$\frac{1}{8} \times \frac{5}{8}$	4 $\frac{3}{4}$	.60
$\frac{5}{16}$	2 $\frac{1}{2}$	.20	$\frac{3}{8} \times \frac{3}{4}$	5	.90
$\frac{3}{8}$	3	.30	$\frac{1}{2} \times 1$	7	1.85
$\frac{7}{16}$	3 $\frac{1}{2}$	.40	$\frac{5}{8} \times 1\frac{1}{4}$	9	3.35
$\frac{1}{2}$	4	.50	$\frac{3}{4} \times 1\frac{1}{2}$	12	5.90
$\frac{5}{8}$	4 $\frac{1}{2}$	.75	1 x 2	14	11.25
$\frac{3}{4}$	5	1.25			
$\frac{7}{8}$	6	2.00			
1	7	3.50			

O. K. TOOL HOLDERS AND TOOLS

O. K. Tool Holders and Tools possess all the advantages of solid forged tools, together with the most economical use of steel, especially the expensive high speed steels. They are forged from the best grades of high speed or self hardening tool steel, accurately ground and tempered. We are prepared to furnish to order, any set or combination of tools that will best fill your requirements.

STANDARD COMPLETE SET



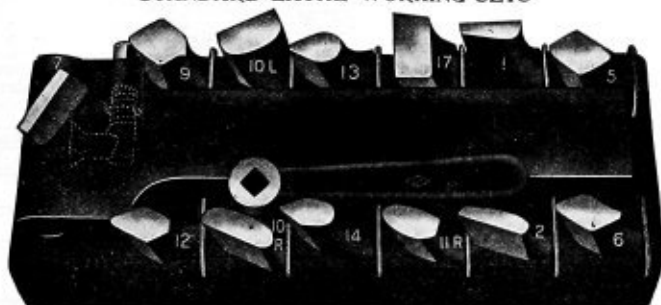
Consisting of holder and twenty-two assorted tools and fixtures, including case. In size C, complete set, we furnish a double knurling fixture and a pair of knurls. Complete set, size B, is regularly furnished with single knurl.

No.	Size, inches	CONTAINS TOOLS, NUMBERS		Price per Set
		Jessop's Steel	High Speed Steel	
A	$\frac{3}{8} \times \frac{3}{4}$	18, 19, 23, 24, 25	1, 2, 13, 3, 4, 5, 6, 7, 8, 9, 12, 12, 13, 14, 15, 16, 17	\$10.75
B	$\frac{1}{2} \times 1$	18, 19, 23, 24, 25	1, 2, 13, 3, 4, 5, 6, 7, 8, 9, 12, 11, 13, 14, 15, 16, 17	12.00
C	$\frac{1}{2} \times 1$ $\frac{1}{4} \times 1\frac{1}{2}$ $\frac{5}{8} \times 1\frac{1}{4}$	18, 19, 23, 24, 25	13, 17, 14, 10L, 10R, 11R, 11L, 15, 16, 5, 9, 6, 1, 12, 2, 13, 12	15.00

The changing of tools is accomplished with little or no loss of time. A quarter turn of the nut releases the tool in the holder and a new tool is substituted without changing the position of the holder.

See the following page for table showing numbers, names and prices of single tools.

O. K. TOOL HOLDERS STANDARD LATHE WORKING SETS



Working Sets in sizes from A to C consist of a holder, block and thirteen assorted tools. From D to H consist of a holder, block and twelve assorted tools.

No.	Size, inches	Set Contains Tools, Numbers. Made of High Speed Steel.														Price, Per Set
A	$\frac{3}{8} \times \frac{3}{4}$	5	6	1	2	17	9	13	14	8	12	12	7	2	}	\$ 5.85
B	$\frac{1}{2} \times 1$	5	6	1	2	17	11R	13	14	8	9	12	7	2		6.50
C	$\left\{ \begin{array}{l} \frac{1}{2} \times 1 \\ \frac{3}{8} \times 1\frac{1}{8} \end{array} \right\}$	12	9	2	1	14	13	10R	10L	11R	17	5	6	7		8.00
D	$\left\{ \begin{array}{l} \frac{5}{8} \times 1\frac{1}{4} \\ \frac{3}{4} \times 1\frac{3}{8} \end{array} \right\}$	1	2	5	6	9	10L	10R	11R	11L	17	12	13	..		13.00

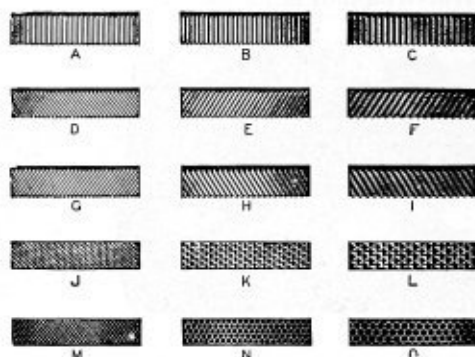
Working Sets for shaper use same as above, except tools are ground with same clearance as planer tools, and tools Nos. 20 and 11L substituted for tools Nos. 13 and 14. Be sure and specify for *shaper use* when ordering.

PRICES OF SINGLE TOOLS

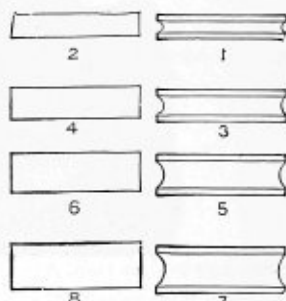
No.	Name of Tool	Made of Jessop's Steel			Made of High Speed Steel			
		A	B	C	A	B	C	D
1	Left Side Tool.....	\$0.20	\$0.21	\$0.25	\$0.30	\$0.33	\$0.40	\$0.75
2	Right Side Tool, bent.....	.20	.21	.25	.30	.33	.40	.75
3	Left Side Brass Tool.....	.20	.21	.....	.30	.33	.....	.....
4	Right Side Brass Tool, bent.....	.20	.21	.....	.30	.33	.....	.....
5	Left Offset Diamond Point.....	.20	.21	.25	.30	.33	.40	.75
6	Right Offset Diamond Point.....	.20	.21	.25	.30	.33	.40	.75
7	Right Side Parting Tool, bent.....	.20	.25	.28	.32	.35	.45	.....
8	Straight Brass Tool.....	.20	.21	.25	.30	.33	.40	.....
9	Left Diamond Point Tool.....	.20	.21	.25	.30	.33	.40	.75
10	Roughing Tool, right or left.....	.....	.....	.....	.....	.....	.40	.75
11	Hog Nose Tool.....	.....	.....	.....	.....	.33	.40	.75
12	Right Diamond Point.....	.20	.21	.25	.30	.33	.40	.75
13	Straight Finishing Thread Tool.....	.26	.30	.35	.35	.40	.50	.85
14	Right Thread Tool, bent.....	.26	.30	.35	.35	.40	.50	.85
15	Female Radius, $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in.....	.45	.50	.50	.55	.63	.75	1.25
16	Male Radius, $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in.....	.45	.50	.50	.55	.63	.75	1.25
17	Flat Nose Tool.....	.20	.25	.30	.35	.40	.60	1.00
18	Inside Boring Fixture.....	.90	1.00	1.10	.....	.....	.....	.....
19	Knurling Fixture.....	.90	1.00	2.00	.....	.....	.....	.....
20	Steel Finishing Tool for Shaper and Planer.....	.....	.....	.....	.....	.....	.50	.75
21	Bull Nose Roughing Tool.....	.....	.....	.....	.....	.....	.....	.85
22	Round Nose—right or left—or straight....	.....	.....	.....	.....	.....	.....	.....
23	Spotting Tool.....	.20	.25	.30	.....	.....	.40	.75
24	Inside Boring Tool.....	.20	.25	.30	.....	.....	.....	.....
25	Inside Threading Tool.....	.20	.25	.30	.....	.....	.....	.....
26	Thread Chasing Tool, 8-10-12-16 pitch.....	.....	.....	.....	.....	.....	1.50	2.00

Complete sets and extra tools of H. S. steel in stock.

KNURLS OR MILLING WHEELS



Letters Indicate Pattern or Design



Numbers Indicate Shape and Width of Face

The designs shown are the ones most commonly used. If a special pattern is desired, send sample or impression.

Price, each.....\$0.75

These knurls will not fit either the Armstrong or Billings Knurling Tool.

THE ARMSTRONG KNURLING TOOL



There are two points of construction in a Knurling Tool which are essential to obtain lasting qualities in the tool itself and uniformity in the work which it produces.

It must be self centering with as little lost motion as possible, and the knuckle or joint must have ample bearing to resist the severe strains of both end and side thrust. In both of these essentials as well as in general design and high quality of material and workmanship the Armstrong Knurling Tool is unexcelled. The knurls and pins are accurately made of Tool Steel suitably tempered. All other parts are Drop Forged or Bar Steel, hardened. Each tool is packed in a cardboard box.

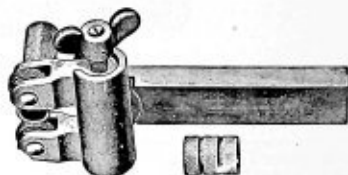
Number	Size Shank, inches	Price with One Pair of Knurls
1K	1/2x1 1/8	\$4.50

Extra Knurls, per pair.....\$0.75

Knurls can be furnished coarse, medium or fine. Medium Knurls sent unless otherwise specified.

BILLINGS IMPROVED KNURLING TOOL

For Use in Engine Lathe for Knurling Metal



The movable arms holding the Knurls, in connection with the rocking joint, have a positive opening and closing movement in parallel lines, actuated by a right and left hand screw, moving the knurls toward and from each other.

Price of Holder, with one pair of Knurls, each, \$5.00
Extra Knurls, per pair......75

ADJUSTABLE KNURL HANDLE

Parallel Sides



Length, 9 inches

Holds Knurls 1/4-inch thick.

Price each.....\$0.80
Price per dozen.....8.00

LATHE DOGS



Drop Forged Dog with Bent Tail



Steel Dog, heavy pattern



Steel Dog, light pattern



Armstrong Clamp Dog

DROP-FORGED DOGS WITH BENT TAIL

No.	Size Dog	SCREW		Price Dogs, Each	Extra Screws, Each	No.	Size Dog	SCREW		Price Dogs, Each	Extra Screws, Each
		Diam.	Length					Diam.	Length		
W-1	3/8	5/16	1 1/8	\$0.40	\$0.06	W-8	2	3/16	2 3/4	\$1.40	\$0.16
W-2	1/2	3/8	1 1/4	.50	.07	W-9	2 1/2	3/16	3	1.70	.16
W-3	3/4	1/2	1 3/8	.60	.08	W-10	3	3/8	3 1/4	2.10	.22
W-4	1	1/2	2	.70	.09	W-11	3 1/2	7/8	3 1/2	2.60	.30
W-5	1 1/4	1 1/2	2 1/4	.85	.09	W-12	4	7/8	3 3/4	3.30	.30
W-6	1 1/2	1 3/8	2 3/8	1.00	.10	W-13	5	1	4 1/2	6.00	.50
W-7	1 3/4	1 1/2	2 1/2	1.20	.12						

The steel screws have United States Standard Threads and the points are hardened.

STEEL LATHE DOGS—Heavy and Light Pattern

HEAVY PATTERN

No.	Size, inches	Price Each	No.	Size, inches	Price Each	No.	Size, inches	Price Each
M-1	3/8	\$0.40	M-8	1 1/4	\$0.80	M-15	3	\$1.60
M-2	1/2	.50	M-9	1 3/8	.95	M-16	3 1/2	1.80
M-3	5/8	.60	M-10	1 1/2	.95	M-17	4	2.10
M-4	3/4	.60	M-11	1 3/4	1.10	M-18	4 1/2	2.75
M-5	7/8	.70	M-12	2	1.20	M-19	5	3.25
M-6	1	.70	M-13	2 1/4	1.35	M-20	5 1/2 Ex	4.00
M-7	1 1/8	.80	M-14	2 1/2	1.45	M-21	6 Ex	5.00

LIGHT PATTERN

No.	Size, inches	Price Each	No.	Size, inches	Price Each
1-M	3/8	\$0.35	7-M	1 3/4	\$1.00
2-M	1/2	.35	8-M	2	1.10
3-M	3/4	.50	9-M	2 1/2	1.40
4-M	1	.60	10-M	3	1.50
5-M	1 1/4	.75	11-M	3 1/2	1.70
6-M	1 1/2	.85	12-M	4	1.90

Hardened Steel Screws, turned in lathes. Heavy pattern has extra heavy boss, so if the thread wears, larger screw can be used.

ARMSTRONG CLAMP LATHE DOGS

Number	Capacity, inches	Weight, lbs.	Price Each	Number	Capacity, inches	Weight, lbs.	Price Each
1	3/8 to 5/8	3/4	\$0.65	5	3/4 to 3	9 1/2	\$2.90
2	1/4 to 1	1 1/4	.90	6	1 to 4	15 1/2	4.00
3	3/8 to 1 1/2	3 1/4	1.40	7	1 1/2 to 5	20	5.00
4	1/2 to 2	4 1/2	2.00				

This Dog is so constructed as to combine the features of the clamp dog with that of the ordinary lathe dog. It will accommodate itself readily to work of any shape and will hold it securely and squarely, being especially adapted for use on finished work.

STEEL DOG WRENCHES



Fitting screw heads from 3/8 to 3/4 inch square. Will answer for both dogs and tool posts.

Price, each\$0.75

DIE DOGS

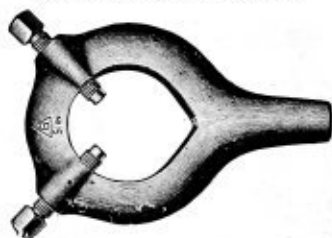
Forged and Hardened



No. 1, 1 1/4 inch between the sides.....	\$3.00
Extra Dies, per pair.....	.50
No. 2, 2 inch between the sides.....	4.00
Extra Dies, per pair.....	.75
Screw, each.....	.10

DROP FORGED DOUBLE SCREW LATHE DOG

With Straight or Bent Tail
Specially designed for heavy work.



Size, inches	Weight, lbs.	PRICE EACH	
		Straight Tail	Bent Tail
5	25	\$6.00	\$ 8.00
6	35	8.00	10.50

Screws used in both sizes, 1 in. dia., 6 in. long. Each.....\$0.75

DROP FORGED "C" CLAMP

Extra Heavy



No.	Opens, inches	Weight	Price Each	Extra Screws, Each
1	1½	5 oz.	\$1.00	\$0.10
2	2½	2 lbs.	2.00	.15
3	3½	5½ "	2.50	.20
4	4½	7½ "	3.25	.30
5	6½	11½ "	5.00	.50

CARRIAGE CLAMPS

Opens inches	Price Each	Price per Dozen	Opens, inches	Price Each	Price per Dozen
2½	\$0.25	\$2.60	7	\$0.75	\$ 7.80
3	.30	3.00	8	.90	9.00
4	.40	4.20	10	1.10	11.00
5	.50	5.00	12	1.35	13.50
6	.65	6.50			

EXTRA HEAVY STEEL MACHINISTS' CLAMPS

Will stand the severest tests.



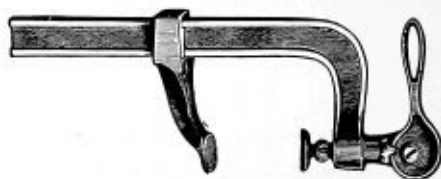
No.	Opens to, inches	Price Each	No.	Opens to, inches	Price Each
1	2	\$1.75	5	6	\$2.75
2	3	2.00	6	8	3.25
3	4	2.25	7	10	3.75
4	5	2.50	8	12	4.25

SNOW'S PATTERN ADJUSTABLE CLAMPS

By placing the thumb and forefinger on the lever the jaws are opened, allowing the screw to move backward or forward to any required position without turning.



Opens, inches	Price Each	Price per Dozen	Opens, inches	Price Each	Price per Dozen
2	\$0.75	\$ 7.55	6	\$1.45	\$14.65
3	.85	8.75	7	1.65	16.45
4	.95	9.75	8	1.95	19.50
5	1.10	11.00			

COLT'S ECCENTRIC CLAMPS**LIGHT PATTERN**

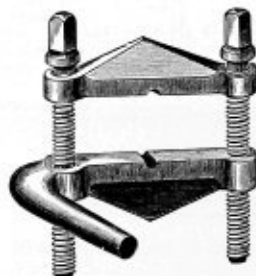
No.	Opens, inches	Price Each	Price per Dozen
0	2½	\$0.35	\$ 3.60
1	4	.45	4.80
2	6	.65	6.60
3	8	.85	8.40
4	12	1.00	10.20

HEAVY PATTERN

Opens, inches	Price Each	Price per Dozen	Opens, inches	Price Each	Price per Dozen
12	\$1.10	\$10.80	36	\$1.80	\$18.00
15	1.15	11.64	42	1.95	19.80
18	1.25	12.48	48	2.15	21.60
21	1.35	13.44	54	2.35	23.40
24	1.45	14.40	60	2.50	25.20
30	1.60	16.20	66	2.70	27.00

CLAMP DOGS

Drop Forged



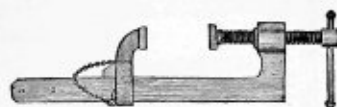
No.	Open Between Screws, inches	Price Each
1	1½	\$1.50
2	2½	2.00
3	3½	2.50

Per set of three.....\$5.50

Starrett's Toolmakers' Parallel Clamps No. 161 may be found on page 74.

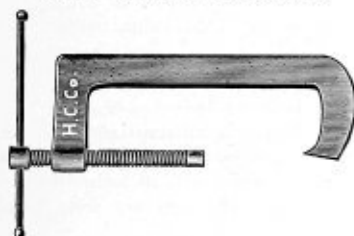
HEAVY SHIP CARPENTERS' CLAMPS

With Sliding Jaw



No.	Size of Screw, Inches	Size of Frame, Inches	Opening of Clamp, Inches	Price Each
14	1½	3 x ¾	30	\$14.25
15	1¾	3½ x ¾	36	17.75
16	2	4 x 1	36	20.00

SHIP CLAMP SCREWS



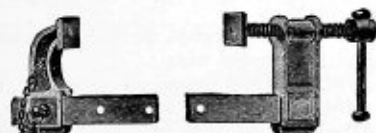
No.	Size of Frame, Inches	Diameter of Screw, Inches	Space in Clear, Inches	Price Each
1	5 x 1½	2½	36x10	\$42.00
2	4½ x 1½	2	33x 9	30.00
3	4 x 1½	1¾	30x 8	22.00
4	4 x 1	1¾	27x 8	19.00
5	3½ x ¾	1¾	24x 7	12.50
6	3 x ¾	1½	21x 6	10.00
7	3 x ¾	1½	18x 5	8.00

BOAT CLAMP SCREWS

Same Style as "Ship," but Smaller

No.	Size of Frame, Inches	Diameter of Screw, Inches	Space in Clear, Inches	Price Each
1	2½ x 5/8	1½	18x5	\$7.00
2	2¼ x 5/8	1½	16x4	5.75
3	2 x 1½	1¼	14x4	5.00
4	1¾ x 1½	1¼	12x3½	4.50
5	1½ x 3/8	1¼	10x3½	3.75
6	1¼ x 3/8	1¼	8x3	3.00
7	1¼ x 3/8	1	6x3	2.50

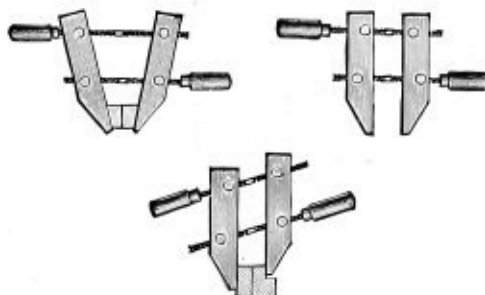
CARPENTERS' AND CABINET-MAKERS' CLAMPS



Refined malleable iron head and jaw, steel bar and screw.

Size, feet.....	2½	3	4	5
Price, each.....	\$3.75	\$4.00	\$4.50	\$5.00

THE PEERLESS ADJUSTABLE CLAMPS



An adjustable Wood Workers' Clamp with spindles and sockets of best steel and jaws of seasoned maple, thus making an invaluable tool.

No.	Length Jaw, Inches	Opens, Inches	Price per Doz.	Price Each
0	7½	4	\$ 6.00	\$0.60
1	9½	6	7.20	.75
2	11½	8	8.40	.85
3	14	10	9.60	1.00
4	16	12	11.40	1.25
5	18	14	13.20	1.50

CABINET MAKERS' WOOD CLAMPS



Bar is maple, 2x1¼ inches; spindle of hickory, ½ inch thick.

Length, Feet	Price Each	Price per Doz.
2	\$0.55	\$5.50
3	.60	6.00
4	.70	7.00
5	.80	8.00
6	.90	9.00

GLUE CLAMPS



Best material, strong and very durable.

Price, each.....	\$0.60
Price, per doz.....	6.00

WOOD HAND SCREWS



Spindles are made of best selected second-growth hickory stock.

Jaws are made of Michigan hard maple—the best for the purpose.

No.	Diam. Screw, inches	Length Screw, inches	Length Jaw, inches	Size Jaw, inches	Open inches	Price, per Dozen
800	1 1/4	28	24	3 x 3	17	\$40.00
801	1 1/4	26	22	2 3/4 x 2 3/4	15 1/2	35.00
802	1 1/4	24	20	2 3/4 x 2 3/4	13 3/4	32.00
803	1 1/4	22	20	2 1/2 x 2 1/2	12	30.00
804	1 1/4	22	18	2 1/2 x 2 1/2	12 1/4	28.50
805	1 1/2	20	18	2 3/4 x 2 3/4	10 1/2	27.00
806	1	20	16	2 3/4 x 2 3/4	11	25.00
807	1	18	16	2 1/4 x 2 1/4	9 1/4	23.50
808	3/8	18	14	2 1/2 x 2 1/2	10	22.00
809	3/8	16	14	2 x 2	8 1/4	20.00
810	3/8	16	12	1 3/4 x 1 3/4	8 1/2	18.50
811	3/4	14	12	1 3/4 x 1 3/4	7 1/4	17.00
812	3/4	12	10	1 3/4 x 1 3/4	5 1/2	14.50
813	5/8	10	8	1 3/8 x 1 3/8	4 1/2	12.00
814	5/8	8	7	1 1/2 x 1 1/2	3	9.50
815	1/2	6	5	1 x 1	2	8.00
816	3/8	5	4	3/4 x 3/4	1 1/4	7.00

WOOD BENCH SCREWS

These Bench Screws are made of hard maple with extra strong cut threads.



Price Each

No. 18. V Thread, 2 x 24 inches	\$0.45
No. 19. V Thread, 2 1/2 x 24 inches	.55

IRON BENCH SCREWS

Wrought iron, with double thread, wood handles.

Price Each

Size 1 x 15	\$0.50
Size 1 1/2 x 15	.55
Size 1 3/4 x 16	.70

CABINET MAKERS' BENCH



List Prices Not Including Stops

No. 1. Regular size, 24 in. by 6 1/2 ft., 16 in. maple top, weight, 180 lbs.	\$11.00
No. 1A. 24 in. by 7 ft., 16-in. maple top, weight, 200 lbs.	12.00
No. 1B. 30 in. by 7 ft., 16-in. maple top, weight, 210 lbs.	13.00
No. 1C. 24 in. by 5 1/2 ft., 16-in. maple top, weight, 150 lbs.	10.00

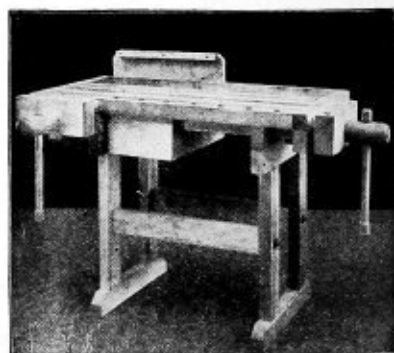
Benches 34 inches high.

Our No. 1 Bench is substantially built throughout. It has a 2 3/4-inch thick, glued and finished top, back of which is a well 10 inches deep, used as a recess for tools; the legs are solid maple and measure 2x3 inches.

Equipped with our No. 19 Bench Screws, 2 1/2 inches in diameter; these screws have saw cut threads.

The illustration shown may be taken to apply also on Nos. 1A, 1B, 1C, as listed above; the only difference being in dimensions.

MANUAL TRAINING BENCH



Length, 42 inches; width, 20 inches; height, 32 inches; top, 13 1/2 inches wide.

No. 9. With rack and drawer as per cut... \$8.00

No. 7. Without rack and drawer... 7.50

Above benches are very conveniently arranged and made of maple throughout. Equipped with two vises operated by two bench screws. Stand securely bolted. We can recommend them as the best of their kind on the market.

ELECTRICIANS' NEW HAND TOOL CASE



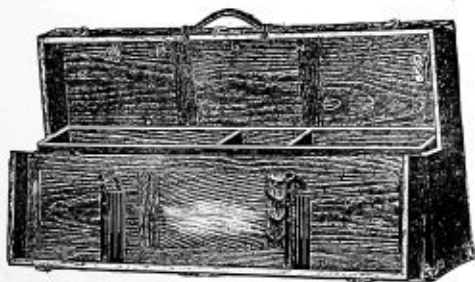
No. 1003

No. 1001—An easily carried, portable tool chest; box hinges, brass handle and trimmings; well made in every particular.

No. 1003—Made of hardwood, handsomely finished, furnished with brass lock, leather handle with rings for shoulder strap, metal clasps, metal corners, and removable tray.

No.	LENGTH		WIDTH		HEIGHT		Price Each
	Out-side, in.	Inside, in.	Out-side, in.	Inside, in.	Out-side, in.	Inside, in.	
1001	21	19	5 1/4	4 1/4	7	6 1/4	\$3.20
1003	25 1/2	24 1/2	5 3/4	4 3/4	8 1/4	7 3/4	4.50

CARPENTERS' NEW HAND TOOL CASE



No. 35—Made of selected hardwood, paneled sides, brass lock, leather handle with rings for shoulder strap, metal clasp and corners, with necessary racks, hooks and trays. Weight, empty, 15 lbs.

No.	OUTSIDE DIMENSIONS, INCHES			INSIDE DIMENSIONS, INCHES			Price Each
	Length	Width	Height	Length	Width	Height	
35	34 1/4	6	17	33	5	15 1/4	\$10.00

Strongly made of hardwood filled and varnished, with two trays, lock and key, dove-tailed corners, panel lid and heavy band mouldings.

MACHINISTS' TOOL CHESTS



These Chests are made of selected hardwood and are furnished with Yale pattern locks, nickel-plated drawer pulls and cup handles. Each chest is provided with a brass elbow to hold up lid, and a device for locking all the drawers at once, automatically.

No.	Length, inches, Outside	Width, inches, Outside	Height, inches, Outside	Drawers	Price
1	20 1/2	13	10 1/2	2	\$7.15
2	23 1/2	14 1/2	12	3	9.00
3	29 1/2	14 1/2	12	3	11.25

MACHINISTS' TOOL CASE

No. 75



This Case can be carried conveniently from place to place; made of chestnut, handsomely finished, has four drawers 3 inches deep and one 3 1/2 inches deep, complete with a brass Yale pattern lock, leather handle and metal corners; the lid locks at the bottom and when open can be slid back over the drawers like the lid of a sectional book-case. Outside dimensions, 19x9x11 1/2 inches. Price, each..... \$7.00

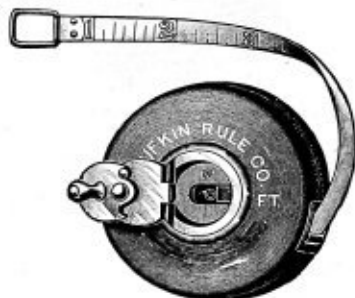
CARPENTERS' EMPTY TOOL CHESTS

No.	Inside Dimensions, inches	Weight	Price Each
260	28 x 15 x 14	58	\$8.25
260 1/2	31 x 15 x 14	66	9.38
270	33 x 18 x 16	95	10.50

LUFKIN MEASURING TAPES



All Lufkin steel tapes, $\frac{1}{4}$ and $\frac{3}{8}$ inches wide up to 100 feet long, are now furnished with "instantaneous" readings (as above) at regular prices.

**"Reliable"****"Reliable Junior"**

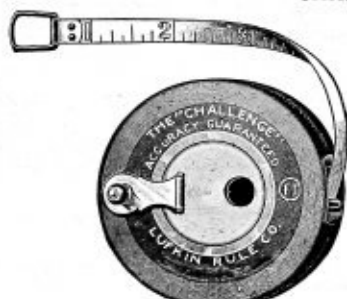
RELIABLE—Steel tape $\frac{3}{8}$ in. wide, double folding flush handle, opened by pushing small pin on opposite side. Hard leather case with nickel-plated trimmings. Measurements guaranteed accurate; strictly highest quality throughout.

RELIABLE JUNIOR—Steel tape $\frac{1}{4}$ in. wide, making it a very convenient pocket size; quality and construction exactly the same as Reliable.

"Reliable"—Marked Feet, Inches and 8ths**"Reliable Junior"—Marked Feet, Inches and 16ths**

Number	Length, feet	Diameter Case, inches	Price Each	Extra for Nickel-plated Tapes, Each	Number	Length, feet	Diameter Case, inches	Price per Dozen
290	25	$\frac{3}{8}$	\$ 4.50	\$1.00	100	25	$\frac{3}{8}$	\$45.00
293	50	$\frac{3}{8}$	7.20	1.50	102	50	$\frac{3}{8}$	55.00
295	75	$\frac{3}{8}$	10.40	1.75	105	75	$\frac{3}{8}$	69.00
296	100	$\frac{3}{8}$	12.80	2.00	106	100	$\frac{3}{8}$	84.00

CHALLENGE STEEL TAPES

**"Challenge"****"Challenge Junior"**

"CHALLENGE"—Steel tapes $\frac{3}{8}$ in. wide. Same quality as "Reliable." Hard leather cases, nickel-plated trimmings, plain flush handle.

"CHALLENGE JUNIOR"—Steel tapes $\frac{1}{4}$ in. wide.

"Challenge"—Marked Feet, Inches and 8ths**"Challenge Junior"—Marked Feet, Inches and 16ths**

Number	Length, feet	Diameter Case, inches	Price Each	Price per Dozen	Number	Length, feet	Diameter Case, inches	Price Each	Price per Dozen
260	25	$\frac{3}{8}$	\$3.90	\$39.00	1260	25	$\frac{3}{8}$	\$3.60	\$36.00
263	50	$\frac{3}{8}$	4.80	48.00	1263	50	$\frac{3}{8}$	4.20	42.00
265	75	$\frac{3}{8}$	6.30	63.00	1265	75	$\frac{3}{8}$	5.40	54.00
266	100	$\frac{3}{8}$	8.10	81.00	1266	100	$\frac{3}{8}$	6.90	69.00

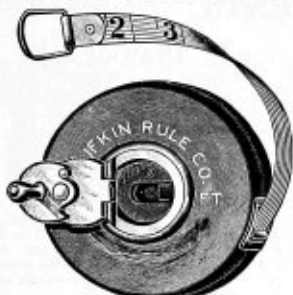
Tapes marked feet and 10ths, one side only, for surveyors' use, furnished promptly from factory at regular prices.

Tapes marked metric measure, one side only, at same price as corresponding lengths in feet.

Tapes marked feet one side, metric measure on the other, add $\frac{2}{3}$ cents per foot to list price.

Tapes marked feet and 12ths one side, feet and 10ths on the other, add $\frac{2}{3}$ cents per foot to list price.

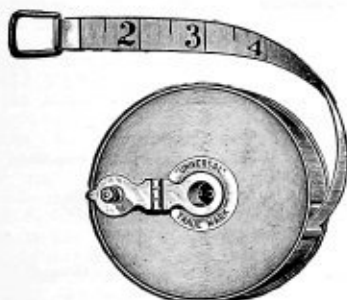
METALLIC MEASURING TAPES



With Patent Double Folding Flush handle same as "Reliable" Steel Tapes; opened by pressing pin on opposite side; tape $\frac{5}{8}$ -inch wide, made of best woven linen with metallic warp. Hard leather case.

Marked One Side Only 12ths	Length, feet	Price Each	Price Dozen
No. 600	25	\$2.40	\$24.00
" 603	50	3.35	33.60
" 605	75	4.10	40.80
" 606	100	5.10	50.40

ASS SKIN MEASURING TAPES



"UNIVERSAL"

With $\frac{1}{2}$ -inch cotton tape, brass bound cases, brass folding handles and trimmings.

Number	Length, feet	Price per Dozen
710	25	\$3.75
713	50	5.00
715	75	7.50
716	100	9.00

MEDIUM GRADE

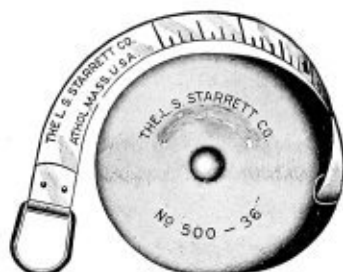
With $\frac{1}{2}$ -inch Union tape, extra quality, cases brass bound, sides enameled, brass folding handles, brass rings, clips and trimmings.

Number	Length, feet	Price per Dozen
720	25	\$ 4.75
723	50	6.25
725	75	8.75
726	100	10.75

Tapes marked in meters and centimeters on back, instead of links, price same as tapes marked both sides.

Tapes marked in feet on back instead of links, price same as tapes marked both sides.

POCKET TAPES

Starrett's $\frac{1}{4}$ -inch Steel Tape

Well finished nickel plated cases with rounded edges. Spring wind with center stop. Marked inches and 16ths.

Length, inches	Diameter of Case	Price Each
36	$1\frac{1}{4}$	\$0.60
60	$1\frac{5}{8}$	.75
72	$1\frac{7}{8}$	.80
96	$1\frac{11}{8}$	1.15

Lufkin $\frac{1}{4}$ -inch Enameled Linen Tape

With handsome and durable round edge nickel plated brass cases, spring wind, center stop.

Marked Inches and 8ths	Length, inches	Price Each	Price per Dozen
No. 173	36	\$0.35	\$3.50
" 175	60	.45	4.50
" 176	72	.50	5.00

STERLING LINEN TAPES



With $\frac{3}{8}$ -inch pure linen tape, reinforced with leather the first 4 inches and heavily coated, nickel plated trimmings, flush handle, hard leather cases, marked one side only, in 10ths or 12ths.

Marked Feet and Inches	Length, feet	Price Each	Price per Dozen
No. 400	25	\$1.50	\$15.00
" 403	50	2.00	20.00
" 405	75	2.50	25.00
" 406	100	3.00	30.00

DRAFTING INSTRUMENTS

Case No. 11215



Pocket Case
containing compasses 5 1/2", with pen and pencil points, key and lead box, in neat leatherette case. They are a great improvement over brass instruments as they are nickelplated and will not rust or tarnish.

Set No. 11215.....\$0.96

Case No. 11184



German silver instruments with steel points; contains 5 1/2" ruling pen, spring blade; steel spring bow pencil 3 1/4" handle; steel spring bow pen 3 1/4" handle; 6" plain dividers; 6" compasses, fixed needle point, pen, pencil point and lengthening bar; box of leads.

Per set.....\$5.90

Case No. 11070

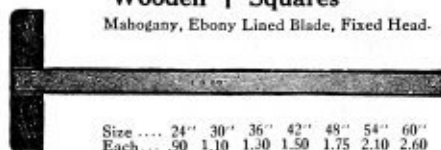
Finest German Silver with steel points, in neat, durable case, pocket book style, velvet lined.



Contains 4 1/2" ruling pen with spring and ebony handle; 5 1/2" ruling pen with spring and ebony handle; steel spring bow dividers, 3 1/2" handle; steel spring bow pencil, 3 1/4" handle; steel spring bow pen, 3 1/4" handle; 6" hair spring dividers; 6" compasses with needle point, pen, pencil point and lengthening bar; box of leads. Per set.....\$10.00

Wooden T Squares

Mahogany, Ebony Lined Blade, Fixed Head.



Size 24" 30" 36" 42" 48" 54" 60"
Each50 1.10 1.30 1.50 1.75 2.10 2.60

Drawing Inks



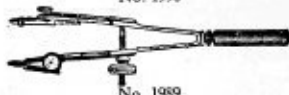
Color	2 oz.	4 oz.	1 Pt.	Fl.	qt.
Black	.25	.90	1.60	3.00	5.75
Yellow	.25	.90	1.60	3.00	5.75
Orange	.25	.90	1.60	3.00	5.75
Scarlet	.25	.90	1.60	3.00	5.75
Carmine	.25	.90	1.60	3.00	5.75
Blue	.25	.90	1.60	3.00	5.75
Green	.25	.90	1.60	3.00	5.75
Brown	.25	.90	1.60	3.00	5.75

These colored inks are dense, true and brilliant. Can be used for lines or washes, are waterproof when dry and can be mixed with water or with each other to produce other shades.

STEEL SPRING BOW DIVIDERS



No. 1990



No. 1989



No. 1988

No. 1988 Steel Spring Bow Dividers.....	\$.90
No. 1989 " " " " " " " " " " " "	1.15
No. 1990 " " " " " " " " " " " "	1.15
No. 1991 Set of above three in case.....	3.80

THUMB TACKS

Brass—Round Heads—In Boxes of One Gross Only



No. 12434 Head 1/2" Diameter.....	Per Gross \$1.00
No. 12435 " 3/4" " " " " " " " " " "	1.30
No. 12436 " 1" " " " " " " " " " " "	1.60

RULING PENS



Detail Ruling Pen



Ruling Pen

No. 1800 4 1/2" Ebony Handle.....	\$.40
No. 1801 5 " " " " " " " " " " " "	.45
No. 1806 4 3/4" " " " " " " " " " " " "	.60
No. 1807 5 " " " " " " " " " " " "	.65
No. 1836 5 " Detail Pen " " " " " " " "	.90

Transparent Triangles

No. 12021 30"x60"		No. 12022 45"	
Size	4 5 6 7 8 9 10 12 14 16 18	Size	4 5 6 7 8 10 12 14 16
Each	.20 .30 .35 .40 .50 .60 .70 .95 1.55 2.35 3.20	Each	.30 .40 .50 .60 .70 1.05 1.55 2.10 3.00

Made of the finest material obtainable; do not accumulate dust; keep their edge like steel tools.

See Index for Drafting Instruments of Starrett's and B. & S. make.

PENS CAREFULLY DRESSED AND SHARPENED..... 25 Cents

ARCHITECTS' LEVELS



No. 6005

No. 6005. A low priced, strictly serviceable Architect's and Builder's Level. Plate carrying leveling screws, is substantially built but an expensive hand finish is dispensed with. Pillars supporting level are rigidly fastened by heavy bronze sleeves. Telescope bearings and center of instrument of the same material and workmanship as highest grade instruments. Telescope is 11 inches long with high quality lenses magnifying 18 diameters. Has a 3-inch horizontal circle, graduated to degrees and vernier reading to 5 minutes. Packed in a neatly finished box, with leather carrying strap and contains trivet, plumb bob, sun shade and adjusting pin.

Price, including tripod.....\$42.50

No. 6100. Meets the demand for an accurate, low priced level. Is especially serviceable for millwrights, etc. Telescope is 11½ inches long with high grade lenses magnifying 18 diameters, rigidly fastened to cross-bar. Level is 5 inches long and adjusted in the usual way. Has a 3-inch silvered circle, graduated to single degrees, vernier reading to 5 minutes. Case for telescope and cross-bar have cloth finish. Packed in a neatly finished box, containing trivet, plumb bob, sun shade and adjusting pin.

Price, including tripod.....\$35.00

EXTRA-FINE ENGINEERS' Y LEVELS

Achromatic Terrestrial Telescope, 18 inches long with dust cap and sun shade, improved rack movement, eyepiece with patent micrometer focus. Sensitive spirit level graduated on the glass, adjustable vertically and horizontally. Telescope rests in Y's, one of which is adjustable for altitude; telescope can be adjusted so cross-hairs are vertical and horizontal. Leveling screws are German silver. Clamp and tangent screws are attached to bar and revolve with it, so they are always accessible. Improved tangent screw of German silver, with counter-spring. Packed in fine finished mahogany box with adjusting pins and waterproof cover.

No.	Telescope, inches	Object Glass, inches diameter	Price, Each, Net Cash
5010	18	1½	\$130.00
5012	20	1½	135.00
5013	22	1½	140.00

BUILDERS' TRANSIT



No. 6015

No. 6015. Powerful telescope 8" long; long sensitive level; clamp and tangent to telescope axis. Horizontal limb is 5" in diameter, divided to degrees, with vernier reading to 2 minutes; vernier plate fitted with two levels at right angles; clamp and tangent screws to upper and lower circles, and is leveled by four screws. Packed in polished wooden box, with sun-shade, plumb bob, screw-driver and adjusting pin.

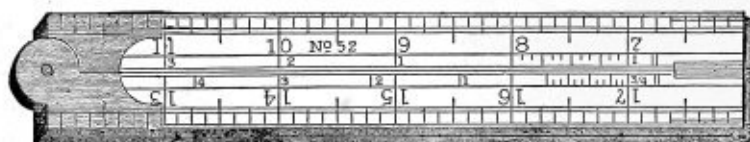
Price, complete with tripod.....\$80.00

THE STANDARD TRANSIT

No. 6145

A Standard Transit, designed to do the work of higher priced instruments on engineering and land surveying. It is most substantially made, with all essential parts, such as accuracy of graduation, sensitive plate levels and optical qualities of telescope, exactly the same as high priced instruments. The horizontal circle is 6¼ inches, verniers read to minutes. Compass needle is 4½ inches long and compass has variation plate. Telescope is 11 inches long; object glass 1½ inches diameter. Has rack and pinion slide and spiral focus. Has shifting center and is leveled with four screws. Packed in well-finished hardwood case containing plumb bob, sunshade, several adjusting pins and reading glass. Price, complete with tripod.....\$160.00

BOXWOOD RULES



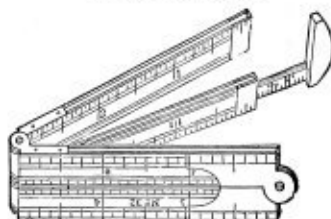
Arch Joint, Half Bound
Two Feet, Four Fold, 1 Inch Wide

No.	Description	Price Each	Per Dozen
68	Round joint, middle plates, 8th and 16th inch graduations.....	\$0.25	\$2.50
63	Square joint, edge plates, 8th, 10th, 12th and 16th inch graduations.....	.40	4.00
52	Arch joint, half bound 8th, 10th, 12th and 16th inch graduations.....	.75	7.25
54	Arch joint, bound, 8th, 10th, 12th and 16th inch graduations.....	.85	8.75

Two Feet, Four Fold, 1 3/8 Inches Wide

No.	Description	Price Each	Per Dozen
72 1/2	Square joint, bound, 8th, 10th and 16th inch graduations.....	\$0.90	\$9.00

CALIPER RULE

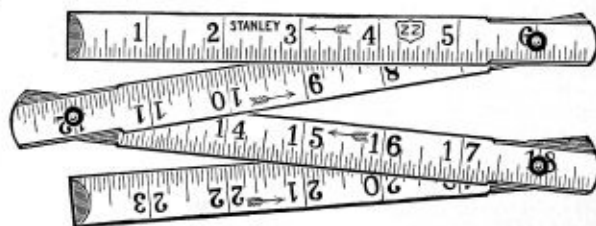


No.	Description	Price Each	Per Dozen
32	1 ft., four fold, arch joint, edge plate, 1 inch wide.....	\$0.70	\$7.00
36 1/2	1 ft., two fold, square joint, 1 3/8 inches wide.....	.60	6.00
36	1/2 ft., two fold, square joint, 3/4 inch wide.....	.40	4.00

FOLDING POCKET RULES

Zig Zag

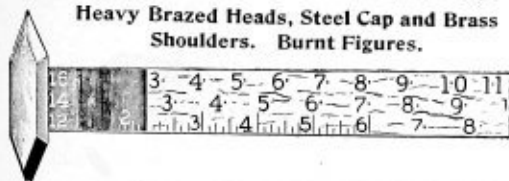
Flexible hardwood, plated steel joints and tips, with stiff spring which holds rule rigid when open; also has patented shield plates.



Six Inch Fold Rivet Joint, White or Yellow

No. White	No. Yellow	Length, feet	WHITE ENAMEL		YELLOW ENAMEL	
			Each	Dozen	Each	Dozen
503	403	3	\$0.35	\$ 3.75	\$0.30	\$3.00
504	404	4	.50	5.00	.40	4.00
505	405	5	.65	6.25	.50	5.00
506	406	6	.75	7.50	.60	6.00
508	408	8	1.00	10.00	.80	8.00

HICKORY BOARD RULES SELECTED SECOND GROWTH WHITE HICKORY Heavy Brazed Heads, Steel Cap and Brass Shoulders. Burnt Figures.



No.	Number of Tiers	Length, Feet	Width, inches	Price, Each	Price, Per Dozen
1	3	3½	1½	\$2.70	\$32.00
2	3	3½	1½	50	25.00
2N	3	3	1	50	25.00
2½	3	3½	1½	40	24.00
3	3	3½	1½	30	23.00
4	3	3	1½	10	21.00
6	3	3	1½	70	27.00
6N	3	3	1	70	27.00
8	4	3	1½	50	25.00
10	5	3	1½	00	30.00

Rules marked one side to measure 12 to 16 feet, opposite side may be marked 8-10-18 or 18-20-22 feet, as desired.

HICKORY LOG RULES Burnt Figures



Square Head Rule

Made with any scale desired. Doyle, Scribner, Doyle-Scribner combined, and decimal scales are regular; all other scales are special. In ordering always state what scale, also whether 8 to 20 or 12 to 24 is wanted. All except No. 15 (36 inches) are figured 48 inches and have 8 inch handles.

No.	Kind	Price, Each	Price, Dozen	No.	Kind	Price, Each	Price, Dozen
14	Square Head	\$2.70	\$27.00	17	Detachable Hook	\$2.80	\$28.00
15	Square Head "T"	2.30	23.00	16½	Flat Steel Hook	2.80	28.00
22	Head Plain	2.70	27.00	18	Double "T" Hook	2.90	29.00
19	Head Solid	2.50	25.00	21	Pick and Hook	2.90	29.00
16	Head Hook	2.70	27.00				

SPRING STEEL BOARD RULES



No.	Number of Tiers	Length, feet	Price, Each	Price, Per Dozen
51	3	3½	\$4.20	\$42.00
52	3	3	3.60	36.00
52½	3	3½	3.30	33.00
58	4	3	3.90	39.00
59	6	3	4.20	42.00

LUMBER GAUGES Nickel Plated

For measuring the thickness of lumber.

No.	Price, Each	Price, Dozen
00	\$0.60	\$6.00



MARTIN ANTI-FRICTION TRUCK CASTERS



Consists of two wheels in a single frame, loosely pivoted to the plate. Anti-friction wheel runs directly over the axis, the weight thus resting entirely upon the axis of the floor wheel and not on the pivot. The feature of their construction is maximum strength with minimum amount of friction.

No. Onlong Plate	Size of Plate, inches	Size of Wheel, inches	Height, inches	Capacity, pounds	Price, Per Set of Four
62	2½ x 3½	1¼ x ¾	2¼	1500	\$ 1.25
72	2½ x 3½	2¼ x ¾	3¼	1500	1.50
82	3¼ x 4½	2½ x ¾	3½	2000	2.00
102	3½ x 4½	3½ x ¾	4½	2500	2.50
112	3½ x 5½	3½ x ¾	4½	3000	3.75
122	4¼ x 6¼	4½ x 1½	5½	4000	7.00
142	5½ x 7½	4½ x 1½	6	5000	11.00

PAYSON'S ANTI-FRICTION CASTERS



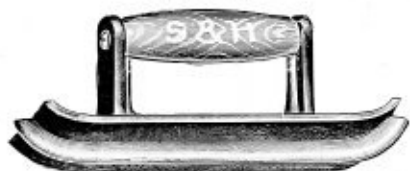
Strong and durable. Plate rests on a series of steel rollers, all weight being carried outside of center of main wheel. This relieves all friction on the pivot and all strain upon the fastening screws.

No.	Size Plate, inches	WHEELS		Height, inches	Capacity, pounds	Price, Per Set of Four
		Diam., inches	Face, inches			
188	3 x 4¼	2½	1¼	3½	1000	\$ 2.75
190	3½ x 4½	3½	1½	4½	1500	4.00
192	4¼ x 6¼	4	2¼	6	2000	12.00
195	6½ x 9¼	6	3¼	9	6000	45.00

CEMENT WORKERS' TOOLS

Iron Nickel Plated

JOINTER



- No. 1. $2\frac{3}{4}$ inches wide, 6 inches long, each. \$0.70

NARROW JOINTER

- No. 41. $1\frac{3}{4}$ inches wide, 8 inches long, $\frac{1}{2}$ -inch blade, each. .80
 No. 43. $1\frac{3}{4}$ inches wide, 8 inches long, $\frac{1}{4}$ -inch blade, each. .80

STRAIGHT END JOINTER

- No. 5. 3 inches wide, 6 inches long, $\frac{1}{2}$ inch deep, each. \$0.80

NARROW STRAIGHT END JOINTER

- No. 42. $1\frac{3}{4}$ inches wide, 8 inches long, $\frac{1}{2}$ -inch blade, each. \$0.80
 No. 36. $1\frac{3}{4}$ inches wide, 8 inches long, $\frac{1}{4}$ -inch blade, each. .80

DRIVEWAY GROOVER



3 Inches Wide, 9 Inches Long

- No. 19. Groove $\frac{3}{4}$ inch deep, each. \$1.45
 No. 7. " half round, each. 1.45
 No. 24. $\frac{5}{8}$ -inch V groover, $\frac{5}{8}$ inch wide, $\frac{1}{2}$ inch deep, each. .70

STRAIGHT END GROOVER

- No. 25. 6-inch V groover, $\frac{5}{8}$ inch wide, $\frac{1}{2}$ inch deep, each. \$0.80

EDGER

 $\frac{3}{4}$ Inch, $2\frac{3}{4}$ Inches Wide, 6 Inches Long

- No. 2. $\frac{3}{4}$ -inch turned edge, each. \$0.70
 No. A2. $\frac{3}{4}$ - " " " 10 inches long, each. 1.80

NARROW EDGER

- No. 38. 8 inches long, $1\frac{3}{4}$ inches wide, each. \$0.80
 No. 37. 6 " " $1\frac{1}{2}$ " " with guide, each. .70

REVERSIBLE HANDLE EDGER

- Right or Left, 1 Inch Turned Edge, $\frac{3}{4}$ Inch Radius

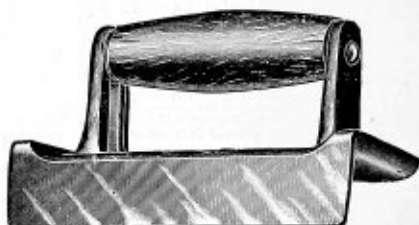
- No. 4. 3 inches wide, 6 inches long, each. \$0.80

CIRCLE EDGER



- No. 23. $\frac{3}{8}$ -inch radius, each. \$0.60
 No. 11. $\frac{3}{4}$ - " " " .60

SQUARE EDGER



3 Inches Wide, 6 Inches Long, Both Edges Rounded

- No. 17. Cutting edge $1\frac{1}{2}$ inches, each. \$1.00

BEVEL EDGER

2 $\frac{3}{4}$ Inches Wide, 6 Inches Long

- No. 40. $\frac{3}{8}$ -inch bevel, each. \$0.70
 No. 18. $\frac{5}{8}$ - " " " .70

CORNER TOOL



One End Straight, Other Curving Back

- No. 6. 6 inches long, $1\frac{1}{2}$ inches wide, each. \$0.70

CURBING EDGER

2 Inch Turned Edge with Radius of $1\frac{1}{2}$ Inches

- No. 100. $3\frac{1}{2}$ inches wide, $6\frac{1}{2}$ inches long, each. \$1.45

RAISED (TUCK) POINTER

Five Sizes: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1 Inch

- No. 12. Any size, each. \$0.60

BOUGHTON LUMBER CRAYONS



Boughton Lumber Pencils are water proof and equal in quality to the best pencil made. Always order by color. $5\frac{3}{4}$ inches long, $\frac{1}{2}$ inch diameter, hexagon, wrapped in strong paper, $\frac{1}{2}$ gross in a box.
Dixon's Lumber Pencils— $4\frac{3}{4}$ inches long, $\frac{1}{2}$ inch diameter.

COLOR	DIXON		BOUGHTON	
	Doz.	Gross.	Doz.	Gross.
Black, (regular).....	\$0.75	\$ 7.50	\$0.75	\$ 7.50
Black, hard.....	.75	7.50	.75	7.50
Black, soft.....	.75	7.50	.75	7.50
Yellow.....	1.08	10.80	1.00	10.00
Brown.....	1.08	10.80	1.00	10.00
Red.....	1.08	10.80	1.00	10.00
Blue.....	1.08	10.80	1.00	10.00
Green.....	1.08	10.80	1.00	10.00
White.....	1.08	10.80	1.00	10.00

METAL WORKERS' CRAYONS

Soapstone



The Genuine are made from selected soapstone and the mark will not disappear when made on iron and heated. The "Compo" are made from pulverized talc and a suitable binder; the mark will not burn off.

Size Inches	Style	GENUINE		"COMPO"	
		Doz.	Gro.	Doz.	Gro.
$\frac{3}{8} \times \frac{1}{2} \times 5$	Flat	\$0.50	\$5.00	\$0.30	\$3.00
$\frac{1}{4} \times \frac{1}{4} \times 5$	Square	.35	3.50	.30	3.00
$\frac{1}{4} \times 5$	Round	.45	4.50	.30	3.00

RAILROAD CHALK CRAYONS



Packed one gross in a box, 5 boxes in a crate.

Size, inches	Color	Price, per Dozen	Price, per Gross
4x1	White.. ..	\$0.15	\$1.10
4x1	Red .....	.15	1.25
4x1	Blue.....	.15	1.50

WHITE ROUND CHALK OR SCHOOL CRAYONS



Per gross (in box).....\$0.25

CARPENTER'S CHALK

Half Round



Color	Price, Dozen	Price, Gross
White.....	\$0.10	\$1.00
Red .....	.10	1.00
Blue .....	.10	1.00

Packed $\frac{1}{2}$ Gro. in a box.

LUMP CHALK

In Odd Size Chunks

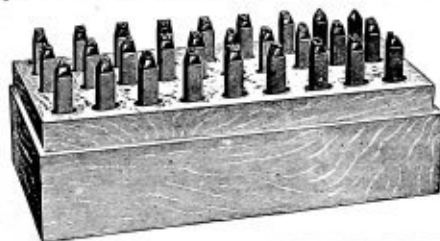
Per pound.....\$0.05

Full barrels weigh about 500 pounds each.

BOUGHTON STEEL LETTERS AND FIGURES

Extra Quality

Made from very highest quality steel, carefully hardened and tempered. Made in Roman style, which gives well defined impressions; especially adapted for use on steel, iron, brass and other hard metals, but should never be used on tempered steel. Each set put up in a neat, compact wooden box. Fully warranted; will outlast and give better satisfaction than any letters on the market.



Size, inches	Figures, per Set	Letters, per Set	Size, inches	Figures, per Set	Letters, per Set
$\frac{3}{8}$	\$ 2.50	\$ 7.50	$\frac{3}{8}$	\$2.25	\$6.75
$\frac{7}{16}$	2.00	6.00	$\frac{1}{4}$	2.50	7.50
$\frac{1}{2}$	1.75	5.25	$\frac{3}{16}$	3.00	9.00
$\frac{9}{16}$	1.50	4.50	$\frac{1}{8}$	3.50	10.50
$\frac{5}{8}$	1.50	4.50	$\frac{1}{16}$	4.50	13.50
$\frac{11}{16}$	1.50	4.50	$\frac{1}{32}$	5.00	15.00
$\frac{3}{4}$	1.50	4.50	$\frac{1}{64}$	6.00	18.00
$\frac{7}{8}$	1.75	5.25	$\frac{1}{128}$	7.50	22.50
1	2.00	6.00	1	9.00	27.00

Prices Less Than Full Sets

Size, inches	Price Each	Size, inches	Price Each
$\frac{3}{8}$	\$0.25	$\frac{3}{8}$	\$0.16
$\frac{7}{16}$	.20	$\frac{1}{4}$	.18
$\frac{1}{2}$	.18	$\frac{3}{16}$	.20
$\frac{9}{16}$	.15	$\frac{1}{8}$	.25
$\frac{5}{8}$	.15	$\frac{1}{16}$	.30
$\frac{11}{16}$	.15	$\frac{1}{32}$	.40
$\frac{3}{4}$	.15	$\frac{1}{64}$	.50
$\frac{7}{8}$	.15	$\frac{1}{128}$	.60

STEEL STAMPS



High grade tool steel furnished with any number of letters.

Size, inches	Price per Letter	Size, inches	Price per Letter
$\frac{3}{8}$	\$0.30	$\frac{3}{8}$	\$0.25
$\frac{7}{16}$	.25	$\frac{1}{4}$	.30
$\frac{1}{2}$	.20	$\frac{3}{16}$	.35
$\frac{9}{16}$	.15	$\frac{1}{8}$	.45
$\frac{5}{8}$	.15	$\frac{1}{16}$	.55
$\frac{11}{16}$	.15	$\frac{1}{32}$	.60
$\frac{3}{4}$	.15	$\frac{1}{64}$	.75
$\frac{7}{8}$	.18	$\frac{1}{128}$	.85
1	.20	1	1.00

Hammer stamps with hole for handle 50c lb. extra for steel forging, 50c lb. extra for forgings on stamps with letters larger than $\frac{1}{4}$ -inch. 25 per cent extra on stamps of two or more lines or stamps cut on curve. Always state purpose stamps are to be used for.

STEEL LOG MARKING STAMPS



For marking the ends of logs. Made of fine tool steel.

Size Letters, inches	Price per Letter or Figure Only	Extra for Forging, per lb.
$\frac{3}{8}$	\$0.75	\$0.50
$\frac{1}{2}$	1.00	.50
$\frac{3}{4}$	1.25	.50
$1\frac{1}{2}$	1.50	.50

ADJUSTABLE BURNING BRANDS



Price Complete

Size Letters, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$
Brand of 4 letters.....	\$ 1.00	\$ 1.00	\$ 1.00	\$ 2.00	\$ 2.50
Brand of 6 letters.....	1.30	1.40	1.50	2.75	3.20
Brand of 8 letters.....	1.60	1.80	2.00	4.00	4.50
Brand of 10 letters.....	1.90	2.20	2.50	4.75	5.50
Brand of 12 letters.....	2.20	2.60	3.00	5.25	6.50
Brand of 14 letters.....	2.50	3.00	3.50	5.75	7.50

Curved Line Brands, Special

ELECTRIC BRANDING AND SOLDERING TOOLS



For Light or Heavy Work

One piece handle, which unscrews and slides back on cord exposing conveniently arranged terminals. Winding chambers entirely enclosed. All seams brazed.

No.	Watts	Price Each	Rewinding Extra	Extra Tips
100	70	\$ 6.00	\$1.25	\$0.30
200	150	8.00	1.75	.50
300	250	10.00	2.50	.75
400	350	12.00	3.00	1.00
500	450	14.00	3.50	1.25
600	550	16.00	4.00	1.50

Furnished with soldering or branding tips as desired.

PATTERN LETTERS



A—Roman. A popular style. Has flat face.
P—Sharp Face Gothic. Draws easily from sand.
D—Round Face Gothic. Heavier than Sharp Gothic;
 convex sides.
H—Hair Line. A very light gothic style.

N—Antique Pointed or Fancy. Ornamental, flat top.
4—Reversed Gothic Branding. Very deep.
L—Reversed Gothic Branding. Not as deep as Gothic
 Branding.

WHITE METAL					BRASS LETTERS				
Size	All Styles Excepting Brands Per 100	Gothic and Roman Brands Per 100	All Styles Excepting Brands Per 100	Gothic and Roman Brands Per 100	Size	All Styles Excepting Brands Per 100	Gothic and Roman Brands Per 100	All Styles Excepting Brands Per 100	Gothic and Roman Brands Per 100
* $\frac{3}{32}$	\$3.00	.....	\$5.00	.....	$\frac{3}{4}$	\$ 5.00	\$10.00	\$ 7.00	\$10.00
$\frac{1}{8}$	2.00	.....	4.00	.....	$\frac{7}{8}$	6.00	.....	8.00	.....
$\frac{1}{4}$	2.00	.....	4.00	.....	1	7.00	11.00	9.00	12.00
$\frac{3}{8}$	2.00	\$4.00	4.00	\$7.00	$1\frac{1}{4}$	10.00	12.00	12.00	15.00
$\frac{1}{2}$	2.00	.....	4.00	.....	$1\frac{3}{4}$	15.00	15.00	18.00	20.00
$\frac{5}{8}$	2.50	6.00	5.00	8.00	$1\frac{3}{4}$	20.00	.....	25.00	.....
$\frac{7}{8}$	3.00	.....	5.00	.....	2	30.00	30.00	30.00	30.00
$\frac{1}{2}$	3.00	8.00	5.00	8.00	$2\frac{1}{2}$	40.00	.....	40.00	.....
$\frac{3}{4}$	4.00	.....	6.00	.....	3	50.00	.....	50.00	.....
$\frac{5}{8}$	4.00	9.00	6.00	9.00	4	60.00	.....	60.00	60.00

Minimum charge, 15 cents net. *Face measurements.

PERFECT LEATHER FILLET

For Pattern Makers, Founders and Machinists



Perfect Leather Fillet can be easily and quickly applied on single or compound curves, and on straight work, with a single operation; tacking, clamping, and use of mitre box being dispensed with.

Is not affected by heat, cold or moisture, and is light, neat and durable.

Cut with curved sides, geometrically correct, forming a perfect arc of a circle when in place.

PRICE PER 100 FEET

Size, inches	Price	Size, inches	Price
$\frac{1}{8}$	\$2.00	$\frac{1}{8}$	\$ 7.00
$\frac{1}{4}$	2.00	$\frac{1}{4}$	8.00
$\frac{3}{8}$	3.00	$\frac{3}{8}$	10.00
$\frac{1}{2}$	4.00	$\frac{1}{2}$	12.00
$\frac{5}{8}$	5.00	$\frac{5}{8}$	14.00
$\frac{3}{4}$	6.00	1	16.00

PATTERN MAKERS' SHRINKAGE RULES

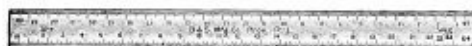
Made of highly finished boxwood, $1\frac{1}{2} \times \frac{3}{8}$, brass capped, graduated 8ths on one side, 16ths on the other.



Number	Extreme Length, inches	Shrinkage per Foot, inches	Price Each	Price per Dozen
8201	$24\frac{1}{8}$	$\frac{1}{8}$	\$1.50	\$15.00
8206	$24\frac{1}{4}$	$\frac{1}{4}$	1.50	15.00
8207	$24\frac{1}{2}$	$\frac{1}{2}$	1.50	15.00
8215	$24\frac{3}{4}$	$\frac{3}{4}$	1.50	15.00
8216	$24\frac{7}{8}$	$\frac{7}{8}$	1.50	15.00
8217	$24\frac{1}{2}$	$\frac{1}{4}$	1.50	15.00

TEMPERED STEEL SHRINK RULES

English Measure



Both Browne & Sharpe and Starrett's make of tempered steel shrink rules are fully listed and described elsewhere. (See Index).

FOUNDRY RIDDLES



Galvanized

2, 3, 4, 6, and 8 Mesh. Per dozen..... \$7.00

Brass

4, 6 and 8 Mesh. Per dozen.....\$11.00

BRASS DOWEL PINS



Made of brass and threaded so they can be driven or screwed into place. Do not shrink and can be removed by unscrewing without injury to the pattern.

No.	Fits Hole	Size Pin	Price per 100 Pair
1	$\frac{3}{16}$	$\frac{1}{8}$	\$ 2.50
2	$\frac{1}{4}$	$\frac{1}{4}$	3.50
3	$\frac{5}{16}$	$\frac{3}{8}$	5.50
4	$\frac{3}{4}$	$\frac{1}{2}$	8.00
5	$\frac{1}{2}$	$\frac{3}{4}$	11.00

STENCILS

Made of Brass



We can furnish these stencils of all sizes and in any shape desired.

Prices on Application

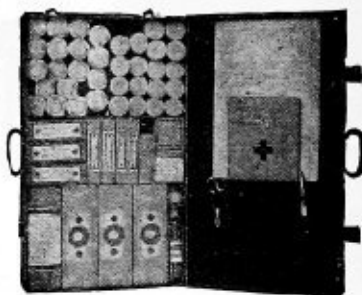
BRASS CHECKS



We are prepared to furnish checks of any size, shape or style, stamped to order if desired.

Prices on Application

MEDICAL CABINET—"FIRST AID TO THE INJURED"



For Mills, Mines, Factories and Shops

One of these compact little cabinets should be handy wherever a large number of people are employed at any hazardous duty.

In one of these cabinets everything is found that is necessary to offer first aid. Many a life might be saved with the use of them. The serious results of many an accident might be avoided if proper attention were given promptly. This cabinet makes it possible to render aid quickly and intelligently.

It is worth many times its price when the occasion for its use arises.

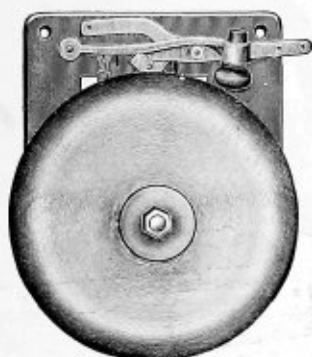
CONTENTS

- Two volumes Johnson's "First Aid for Wounds."
- Two ounces Red Cross Absorbent Lint.
- One capsule Iodoform Gauze.
- Six packages Red Cross Absorbent Gauze, each containing one yard.
- Three packages Red Cross Absorbent Cotton, each containing four ounces.
- One spool Johnson's "Z O" Adhesive Plaster, 1 inch wide, 10 yards long.
- Nine Red Cross Cotton Roller Bandages, 2 inches wide.
- Nine Red Cross Cotton Roller Bandages, 2½ inches wide.
- Nine Red Cross Lint Gauze Bandages, 2 inches wide.
- Nine Red Cross Lint Gauze Bandages, 2½ inches wide.
- One jar Carbolyzed Petrolatum.
- One bottle for Camphenol Antiseptic Solution.
- One bottle Camphenol.
- Two packages Safety Pins.
- One pair Scissors.
- One Tourniquet for arresting hemorrhage.
- One pair Tweezers.
- One Johnson's First Aid Manual.

Price each\$10.00

TRIP GONG BELLS

Polished Bell Metal, Brass



All bells of above pattern over 8 inches in diameter have wooden hammers.

Diam., inches	Price, Each	Price per Dozen	Diam., inches	Price, Each	Price per Dozen
4	\$ 1.25	\$ 12.50	14	\$21.20	\$212.00
5	1.65	16.50	16	26.00	260.00
6	2.40	24.00	18	31.00	310.00
8	4.60	46.00	20	40.00	.....
10	8.40	84.00	24	98.00	.....
12	15.00	150.00			.....

Furnished either right or left hand. Right hand will be sent unless otherwise specified.

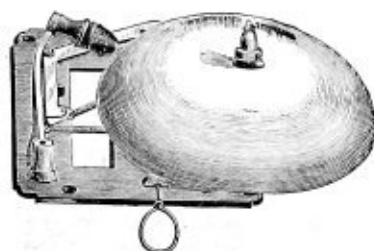
"Steel"



Nickel plated shell, aluminum plated base, nickel plated malleable attachments.

Diameter, inches	Price, Each	Price per Dozen
6	\$1.80	\$18.00
8	3.60	36.00
10	6.00	60.00
12	9.00	90.00

LOCOMOTIVE GONG BELLS



Made from wrought brass. Equal in tone to bell metal. Wood hammers on all sizes.

Diameter, inches	Price, Each	Price per Dozen
4	\$ 1.25	\$ 12.50
5	1.65	16.50
6	2.40	24.00
8	4.60	46.00
10	8.40	84.00
12	15.00	150.00

BINNACLE AND FOG SIGNAL BELLS

Detachable Bracket



Pure Bell Metal. Brass Trimmings

Diameter, inches	Approximate Weight, lbs.	Price Each, Bell Plain With Bracket	Price Each Bell, All Parts Polished
6	5	\$ 4.20	\$ 5.20
8	12	7.48	8.86
10	25	19.00	22.00
12	40	30.00	32.00

8 inch standard size.

ROOF OR HOOD GONGS

Nickel plated, steel shell, malleable strikers.

Diameter, inches	10	12
Price, each	\$ 3.50	\$ 3.90
Price, per dozen	34.80	39.00

FARM BELLS

Made of "Silvery" Steel. Bell is Bronze Coated
and all Mountings are Japanned



Style of Nos. 1, 2, 3



Style of No. 4

No.	Diameter, inches.	Weight Complete, Pounds	Price Each
1	15	40	\$3.20
2	17	50	4.00
3	19	75	6.00
4	20	100	8.00

SCHOOL AND CHURCH BELLS

Made of "Silvery" Steel



Cut of School Bell

Church Bell same in construction, but with tolling hammer.

SCHOOL BELLS

Diameter, inches	Weight of Bell and Mountings	Price Each
20	160 lbs.	\$15.00
22	210 "	20.00
24	265 "	25.00
26	345 "	40.00
28	420 "	50.00

CHURCH BELLS

Diameter, inches	Weight of Bell and Mountings	Price Each
30	540 lbs.	\$ 65.00
32	610 "	75.00
34	745 "	90.00
36	910 "	110.00
38	1020 "	125.00
40	1270 "	150.00

FIRE ALARM BELLS



Diam., inches	Weight Bell Complete	Price Each	Diam., inches	Weight Bell Complete	Price Each
30	530 lbs.	\$ 70.00	40	1200 lbs.	\$155.00
32	620 "	80.00	42	1395 "	180.00
34	700 "	95.00	44	1560 "	205.00
36	845 "	115.00	46	1720 "	230.00
38	1000 "	135.00	48	2015 "	260.00

WIRE CASTING BRUSHES



Solid back; best grade flat tempered wire, uniformly filled. Furnished both on blocks with or without handles.

Length Wire, inches	Size—Rows	Each	Dozen
3	4x10	\$0.50	\$5.00
3	5x10	.55	5.50
4	5x10	.60	6.00

Furnished with leather strap handles at an extra price of per dozen\$0.60

MOLDERS' BRISTLE DUSTERS



HARD DUSTER
Top handle, wire drawn

HARD DUSTER WITH HANDLE

Size Block, inches	Kind of Bristles	Price Each	Price Dozen
10½x2½	Gray Mixed Tampico	\$0.50	\$5.25
10½x2½	All Gray Horsehair	1.00	9.75



HARD DUSTER
No handle

HARD DUSTER WITHOUT HANDLE

No.	Bristles	Price Each	Price Doz.
1	Gray Mixed	\$0.40	\$4.00
2	Gray Mixed (extra grade)	.45	4.60



SOFT DUSTER
Wire Fastened

SOFT DUSTER

No.	Price Each	Price Per Dozen
1	\$0.60	\$ 6.20
2	.90	9.00
3	1.00	10.50

GLUE AND MARKING BRUSHES

EXTRA GLUE BRUSHES

All pure Russia bristle with iron handles to prevent shrinking, brass ferrule.



No.	Diam.	Length Bristles	Each	Dozen
000	5/8	1½	\$0.55	\$ 5.60
00	¾	1¾	.60	6.00
0	7/8	2	.70	7.00
1	1	2½	.85	8.50
2	1½	2¾	1.00	10.00
3	1¾	2¾	1.25	12.50
4	1½	2½	1.60	16.00

BRISTLE MARKING BRUSHES

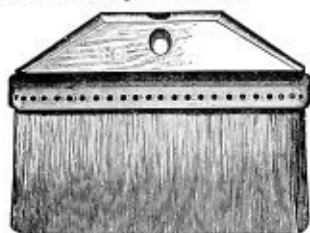
Both round and flat styles, with cedar handles, in tin. A good bristle marking brush.



No.	Each	Dozen
1	\$0.06	\$0.60
2	.07	.65
3	.08	.75
4	.09	.80
5	.09	.90
6	.10	.95
Assorted	Nos. 1 to 6	.80

WHITEWASH BRUSHES

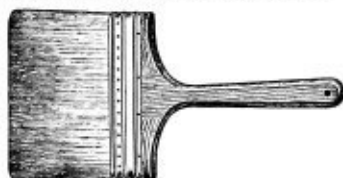
Our "Reliable" brushes are metal bound with varnished head. All Tampico or Fibre.

**"Reliable"**

Number	Width, inches	Length Bristles, inches	Price Each
7	7	3	\$0.55
8	8	3	.60
9	9	3 1/4	.70

STAR CALCIMINE BRUSHES

Metal bound, white bristle outside, soft white Tampico center, natural wood handle, varnished.



Number	Width, inches	Length Bristles, inches	Price Each
6	6	3 1/4	\$1.25
7	7	3 1/2	1.35
8	8	3 3/4	1.90

O. K. CALCIMINE BRUSHES

Best quality okatka bristles, brass bound, natural wood, varnished handle, medium length.

Number	Width, inches	Length Bristles, inches	Price Each
6	7	4 1/2	\$ 5.80
7	7	4 3/4	7.40
8	8	5	10.00

SCRUB BRUSHES

Number	Fibre	For Work Suitable	Price	
			Each	Dozen
5	Tampico	General	\$0.20	\$2.10
7	Bass	Hard Work	.25	2.40

ROOFING BRUSHES

Leather bound, mixed bristle and fibre, very full double nailed for paint, tar or any roofing liquid.



Width, inches	Length Bristles, inches	Each	Dozen
7	4	\$2.80	\$28.00
8	4	3.20	31.80
9	4	3.60	36.00
10	4	4.00	40.00

KNOTTED ROOFING BRUSHES

Number Knots	Length Bristles, inches	Each	Dozen
2	4	\$1.50	\$15.00
3	4	2.10	21.00
4	4	2.70	27.00

COUNTER DUSTERS

With black bristles, wire drawn, natural wood finished handles.



Number	Size Face, inches	Length Over All, inches	Price	
			Each	Dozen
2	4 x 8	14	\$0.70	\$7.00
3	4 x 9	15	1.30	13.00

FLOOR BRUSHES

Red polished blocks and handles, black horse hair, wire drawn, with handles.



Number	Length, inches	Price Each
52	12	\$1.05
54	14	1.20
56	16	1.45

DIRECTIONS FOR THE CARE AND USE OF BRUSHES

It is important to properly swell a new brush before putting it to use, but **under no circumstances should it be put into water to soak**, for if this is done the brush will always work flabby, and if the bristles are of a fine grade you may expect your brush to twist out of shape. The best method of swelling the head of a brush that has dried out is to separate the bristles carefully and pour about a tablespoonful of water on the brush end of the handle and then allow the brush to stand **bristle up**, until the water has been absorbed. This will swell the part and make the brush as firm as when just made.

FLAT WALL PAINT BRUSHES



Brass band, nickel plated; imitation rosewood handle; extra black Chinese bristle. **This is the popular brush.**

Number	Width inches	Length Bristles, inches	Price Each	Price Dozen
51	3	2 3/4	\$0.85	\$ 8.60
52	3 1/2	3	1.15	11.30
53	4	3 1/4	1.50	15.30
56	3	3 3/4	1.60	16.00
57	3 1/2	3 7/8	2.10	21.00
58	4	4 1/8	2.70	26.80

ROUND WALL PAINT BRUSHES

Wire Bound



White Russia bristle outside, mixed Tampico center; a good low priced brush.

Number	Length Bristles, inches	Price Each	Price Dozen
6	2 1/4	\$0.35	\$ 3.60
2	3 1/4	.60	6.20
4-0	4 5/8	1.10	11.00

PAINTERS' DUSTERS

Set with Pitch Extra Deep in Block



Number	Length Bristles, inches	Price Each	Price Dozen
2	3 1/2	\$0.90	\$ 9.40
14	4	1.65	16.80

CONGO CHISEL FLAT VARNISH BRUSHES

Chinese Bristle, Chisel Point, Yellow Handle



Width, inches	Length Bristles, inches	Price Each	Price Dozen
1	1 1/4	\$0.20	\$1.80
2	2	.35	3.60
3	2 1/8	.60	5.75

CHISEL OVAL VARNISH BRUSHES

Steel nickel-plated ferrule; pure black China bristles.

Number	Length Bristles, inches	Price Each	Price Dozen
5-0	3 1/8	\$1.45	\$14.60
7-0	3 1/2	1.90	19.00
10-0	4 1/8	3.20	32.00

BLACK STENCIL BRUSHES

Steel nickel-plated ferrule; natural wood handle; selected black China bristles, fastened with a steel plug.



Number	Diameter, inches	Length Bristles, inches	Price Each	Price Dozen
88	1 1/4	1 1/2	\$0.80	\$8.00
220	1 5/8	1 3/4	1.25	12.50

FRENCH SASH TOOLS

Common grade all white bristles: short wire ferrule.



Number	Length Bristles, inches	Price Each	Price Dozen
1	1 1/4	\$0.07	\$0.70
4	...	.12	1.10
8	1 7/8	.25	2.50

CHANNON'S MARINE PAINTS AND VARNISHES

We invite your careful attention to our **MARINE PAINT**, which for many years has been manufactured under our own formulae and sold to the most particular trade. All colors bear our company name, which is a guarantee of their excellence. The durability and covering capacity of our paints cannot be surpassed, having been used in marine work for the past thirty years.

**MARINE PAINT**

For General Use on Wood or Iron Work

Put up in liquid form, in eight shades: Black, lead color, red, red brown, slate, vermilion, light and dark green.

VERMILION

1-gallon cans.....	\$1.90 gal.
1/2 " " ".....	2.00 "

ALL OTHER SHADES

1-gallon cans.....	\$1.35 gal.
5 " buckets.....	1.30 "
Barrels and half barrels.....	1.25 "

MARINE WHITE

A Special Paint—Very High Grade—In Liquid Form

Flat Marine White dries without a gloss; for all undercoat work and where a dead or flat finish is desired.

Gloss Marine White is a superior white for all inside work. Dries with a good lustre and is guaranteed to retain its whiteness longer than any of the so-called white enamels. Can be used over flat Marine White, or where a surface has been painted white before. Two coats will make a hard enameled finish.

1-gallon cans.....	flat \$1.40, gloss \$2.00 gal.
5 " cans.....	1.35, " 1.95 gal.

STEAMSHIP BLACK

In Paste Form—10 and 20-lb. cans

Can be reduced by using boiled linseed oil, turpentine and sufficient japan to insure proper drying. It is the blackest and most economical black that can be manufactured.

Price, per lb.....	12c
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BUILDING PAINTS

For Outside Use on New Construction or Old Structural Steel and Ironwork

Put up ready for use in six desirable shades: Red, red brown, slate, lead color, moss green and dark brown.

1-gallon cans.....	\$1.00 gal.
5 " buckets.....	.95 "
Barrels and half barrels.....	.90 "

MARINE WHITE LEAD IN KEGS

Guaranteed for Whiteness, Covering Capacity and Durability

We have had this brand of our own in use for more than a quarter of a century and it has always given universal satisfaction. It is not a carbonate of lead, same as all of the well known brands of White Lead, but is guaranteed to wear better; will not chalk, peel or crack; takes more oil to mix it than any white lead; covers more surface potnd for pound; is whiter and brushes out evenly under the brush.

In 12 1/2-lb. kegs.....	9c lb.
In 25 and 50-lb. kegs.....	8 1/2c lb.
In 100 lb. kegs.....	8c lb.

GRAPHITE PAINT

A paint composed of graphite is not only the most durable that can be produced, but also possesses great spreading qualities, one gallon ready for use covering from 600 to 700 square feet of iron surface. Graphite possesses many fireproofing qualities and withstands the action of acids, alkalies, water, brine and sulphur fumes.

Paste, 12 1/2 or 25-lb. cans.....	8c lb.
Liquid, 1-gal. cans.....	\$1.25 gal.
" 5-gal. buckets.....	1.20 "
" barrels and half barrels.....	1.15 "

Special graphite mixtures (not pure graphite) may be had in light and dark gray, red and red brown.

VARNISHES

We carry a complete line of interior and exterior varnishes, put up in 1-gallon and 5-gallon cans, for floors, furniture, and all work where a good durable finish is wanted.

Best Furniture Varnish (for all inside work).....	\$2.00 gal.
Best Coach Varnish (for all outside work).....	3.00 "

COLORS GROUND IN OIL

include umbers, siennas, chrome greens and yellows, vermilions, etc. Prices and any desired information upon application.

Note—Pure Linseed Oil (raw and boiled), Japans, Turpentine, Benzine and all thinning material we supply in original packages at the lowest ruling prices.



SAND, GARNET AND EMERY PAPER AND CLOTH

(24 Sheets in a Quire; 20 Quires in a Ream)

FLINT (SAND) PAPER

IN SHEETS 9x11 INCHES					IN ROLLS 50 YARDS LONG					
No.	Size of Original Packages	Number of Reams in a Bundle	Price per Quire	Price per Ream	Size	WIDTH OF ROLL				
4-0 to 1/2	1/2 Ream	5	\$0.38	\$6.25	4-0 to 1/2	24 in.	30 in.	36 in.	40 in.	42 in.
1 1/2	"	4	.40	6.75	1 1/2	\$6.75	\$9.00	\$11.00	\$12.25	\$14.25
2 1/2	"	3	.43	7.25	2 1/2	7.25	9.50	11.50	13.75	14.75
3 1/2	"	2 1/2	.45	7.75	3 1/2	7.75	10.00	12.00	14.25	15.25
4	"	2	.50	8.25	4	8.50	10.50	12.50	14.75	15.75
Assorted	"	1 1/2	.60	9.50	1 1/2	9.25	11.00	13.25	15.50	16.50
		1	.70	10.75	2 1/2	10.25	12.00	14.25	16.75	18.00
		1	.80	11.75	3 1/2	11.25	14.00	16.50	19.00	20.00
		4		7.25	4	12.25	16.50	18.75	22.00	23.00

GARNET PAPER

IN SHEETS 9x11 INCHES					IN ROLLS 50 YARDS LONG					
No.	Size of Original Packages	Number of Reams in a Bundle	Price per Quire	Price per Ream	Size	WIDTH OF ROLL				
4-0 to 0	1/2 Ream	5	\$0.40	\$6.50	4-0 to 1/2	\$7.50	\$9.75	\$12.00	\$14.00	\$16.25
1 1/2	"	3 1/2	.40	6.50	1 1/2	7.75	10.25	12.50	14.50	16.75
2 1/2	"	3	.40	7.00	2 1/2	8.00	10.75	13.00	15.25	17.25
3 1/2	"	2 1/2	.43	7.50	3 1/2	8.50	11.25	13.50	15.75	17.75
4	"	2	.47	8.00	4	9.25	12.00	14.00	16.25	18.25
Assorted	"	1 1/2	.50	8.50	1 1/2	10.25	13.00	15.25	17.25	19.00
		1 1/2	.60	9.75	2 1/2	12.00	15.25	17.25	20.00	21.75
		1	.70	11.00	3 1/2	13.00	17.25	20.00	22.75	24.75
		1	.80	12.00	4					
		4		7.50						

EMERY PAPER

IN SHEETS 9x11 INCHES					IN ROLLS 50 YARDS LONG		
No.	Size of Original Packages	Number of Reams in a Bundle	Price per Quire	Price per Ream	Size	Furnished in 24-inch Width Only	Price per Roll
4-0 to 0	1/2 Ream	5	\$0.60	\$9.25	4-0 to 1/2		\$10.00
1 1/2	"	3 1/2	.60	9.25	1 1/2		11.50
2 1/2	"	3	.70	11.00	2 1/2		12.00
3 1/2	"	2 1/2	.75	11.50	3 1/2		12.50
4	"	2	.80	12.25	4		14.25
Assorted	"	1 1/2	.90	14.00			17.50
		1 1/2	1.00	16.50			20.00
		1	1.15	19.25			
		4		11.50			

EMERY CLOTH

IN SHEETS 9x11 INCHES						IN ROLLS 50 YARDS LONG			
No.	Nos.	Size of Original Packages	Number of Reams in a Bundle	Price per Quire	Price per Ream	Size	WIDTH OF ROLL		
Crocus, FF. F		1/2 Ream	3	\$1.60	\$26.50	Crocus	9 inch	18 inch	27 inch
000	180	"	3	1.60	26.50	FF. to 1/2	\$9.25	\$18.50	\$27.75
00	150	"	3	1.60	26.50	1	9.25	18.50	27.75
0	120	"	3	1.60	26.50	1 1/2	10.50	21.00	31.50
1/2	90	"	2 1/2	1.60	26.50	2	11.00	22.00	33.00
1	80	"	2	1.70	28.50	2 1/2	11.50	23.00	34.50
1 1/2	70	"	1 1/2	1.80	29.75	3	12.00	24.00	36.00
2	60	"	1	1.85	30.75	3 1/2	13.25	28.50	39.75
2 1/2	54	"	2	2.00	33.00		14.25	28.50	42.75
3	46	"	2	2.10	35.25				
3 1/2	36	"	1 1/2	2.25	37.50				
Assorted		"	2 1/2		28.50				

FLINT (SAND) CLOTH

IN ROLLS 50 YARDS LONG. PRICE PER ROLL						
Width, inches	Nos. 00 to 1/2	No. 1	No. 1 1/2	No. 2	No. 2 1/2	No. 3
14	\$12.00	\$13.00	\$13.75	\$14.50	\$15.50	\$16.50
28	24.00	26.00	27.50	29.00	31.00	33.00

GARNET CLOTH

IN ROLLS 50 YARDS LONG. PRICE PER ROLL						
Width, inches	Nos. 00 to 1/2	No. 1	No. 1 1/2	No. 2	No. 2 1/2	No. 3
14	\$14.00	\$15.00	\$15.50	\$16.00	\$16.50	\$17.00
28	28.00	30.00	31.00	32.00	33.00	34.00

FILES.

We carry a stock of all sizes and kinds of Files.



Mill Bastard.



Flat Bastard.



Flat Bastard, Second Cut.



Flat Smooth.



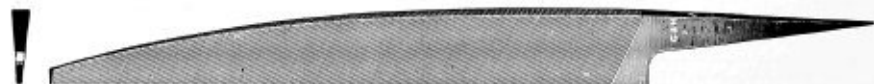
Hand Bastard.



Half Round Bastard.



Warding Bastard.



Knife Bastard.



Round Bastard.



Square Bastard.



Feather Edge Bastard.

FILES.



Regular Taper Saw File, Single Cut.



Slim Taper Saw File, Single Cut.



Double End Taper Saw File, Single Cut.



Stub's Pattern Saw, Double Cut to Point.



Pit Saw File.



Blunt Saw File.



Band Saw File.



Lightning or Cant Saw File.



Planer Knife File.



Half Round Wood Rasp.



Half Round Cabinet Rasp.

To Take Effect on and after November 1, 1899.

Diameter, inches.....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Length, inches.....	3 and 4	5	6	7	8	9	10	12	14	16	18	20

EXTRA [X*F] FINE SWISS PATTERN FILES

All cuts revised to the original Swiss standard and higher grade steel used than heretofore ever put into files. Unsurpassed in evenness of cut and endurance. We carry large stock and can guarantee prompt delivery of all styles and cuts

HAND FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.80	\$3.15	\$4.35	\$4.80	\$7.00	\$9.55	\$12.30
Doz., Nos. 3-4.....	2.90	3.30	4.50	5.00	7.20	9.90	12.60
Doz., No. 6.....	3.15	3.55	5.00	5.40	8.00	11.10	14.00

PILLAR FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.60	\$2.95	\$4.00	\$4.30	\$6.50	\$8.70	\$11.20
Doz., Nos. 3-4.....	2.65	3.00	4.15	4.40	6.70	8.90	12.00
Doz., No. 6.....	2.70	3.10	4.25	4.55	6.90	9.30	14.10

NARROW PILLAR FILES

Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.60	\$2.95	\$4.00	\$4.30	\$6.50	\$8.70	\$11.20
Doz., Nos. 3-4.....	2.65	3.00	4.15	4.40	6.70	8.90	12.00
Doz., No. 6.....	2.70	3.10	4.25	4.55	6.90	9.30	14.10

EXTRA NARROW PILLAR FILES

Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.60	\$2.95	\$4.00	\$4.30	\$6.50	\$8.70	\$11.20
Doz., Nos. 3-4.....	2.65	3.00	4.15	4.40	6.70	8.90	12.00
Doz., No. 6.....	2.70	3.10	4.25	4.55	6.90	9.30	14.10

HALF-ROUND FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.90	\$3.20	\$4.35	\$5.00	\$7.80	\$10.70	\$12.90
Doz., Nos. 3-4.....	3.00	3.70	4.95	5.60	8.75	13.80	16.90
Doz., No. 6.....	3.15	4.20	5.30	6.15	9.55	16.20	19.30

CROSSING OR OVAL FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.80	\$3.70	\$5.00	\$5.60	\$8.50	\$11.50	\$14.70
Doz., Nos. 3-4.....	2.85	3.80	5.40	6.10	9.25	14.30	18.50
Doz., No. 6.....	2.95	4.00	5.80	6.55	10.10	16.90	22.00

BARRETTE FILES

Cut on One Side



Size, inches.....	3	4	5	6	7	8	12
Doz., No. 00 to 2.....	\$2.80	\$3.70	\$5.25	\$6.20	\$7.95	\$9.15	\$15.50
Doz., Nos. 3-5.....	2.85	3.75	5.40	6.35	8.15	9.85	15.70
Doz., Nos. 6-8.....	2.95	3.85	5.60	6.65	8.85	9.55	16.00

ROUND FILES

Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.05	\$2.50	\$3.35	\$3.70	\$5.65	\$7.60	\$9.30
Doz., Nos. 3-4.....	2.05	2.60	3.50	3.90	6.00	8.35	10.10
Doz., No. 6.....	2.05	2.65	3.70	4.10	6.40	9.55	11.30

SQUARE FILES

Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.25	\$2.80	\$3.85	\$4.40	\$6.40	\$7.20	\$8.80
Doz., Nos. 3-4.....	2.25	2.95	3.95	4.55	6.80	8.00	9.60
Doz., No. 6.....	2.25	3.05	4.05	4.70	7.20	8.80	10.40

TAPER THREE SQUARE FILES

Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.80	\$3.30	\$4.35	\$5.00	\$7.80	\$9.15	\$11.20
Doz., Nos. 3-4.....	2.95	3.40	4.45	5.10	8.15	9.65	11.60
Doz., No. 6.....	3.05	3.50	4.60	5.25	8.55	9.90	12.00

WARDING FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.55	\$3.15	\$4.20	\$4.80	\$6.80	\$9.00	\$11.40
Doz., Nos. 3-4.....	2.60	3.30	4.40	5.00	7.20	9.60	12.20
Doz., No. 6.....	2.70	3.45	4.60	5.20	7.60	10.00	12.60

KNIFE FILES



Size, inches.....	3	4	5	6	8	10	12
Doz., No. 00 to 2.....	\$2.90	\$3.60	\$4.90	\$5.40	\$8.80	\$10.30	\$12.30
Doz., Nos. 3-4.....	3.00	3.70	5.10	5.80	9.20	10.70	12.70
Doz., No. 6.....	3.05	3.80	5.30	6.20	9.60	11.10	13.10

EXTRA [X*F] FINE SWISS PATTERN FILES

All cuts revised to the original Swiss standard, and higher grade steel used than heretofore ever put into files. Unsurpassed in evenness of cut and endurance. We carry large stock and can guarantee prompt delivery of all styles and cuts.

CROCHET FILES



Size, inches . . .	3	4	5	6	8	10
Doz., No. 00 to 2	\$2.80	\$3.50	\$4.60	\$5.40	\$8.35	\$11.60
Doz., Nos. 3-4 . .	3.00	3.70	4.95	5.70	8.75	12.00
Doz., No. 6	3.20	3.90	5.25	6.00	9.15	12.45

PIPPIN FILES

Size, Inches . . .	3	4	5	6	8	10
Doz., No. 00 to 2	\$2.80	\$3.70	\$5.00	\$5.60	\$8.50	\$11.50
Doz., Nos. 3-4 . .	2.85	3.80	5.40	6.10	9.25	14.30
Doz., No. 6	2.95	4.00	5.80	6.55	10.10	16.90

EQUALING FILES



Size, in.	3	4	5	6	8	10	12
All Cuts, \$2.50	\$3.20	\$4.55	\$4.90	\$6.90	\$10.00	\$13.50	

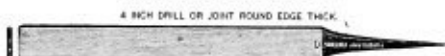
SLITTING FILES



Size, in.	3	4	5	6	8	10	12
All Cuts, \$3.15	\$4.00	\$5.70	\$6.80	\$9.40	\$12.60	\$16.00	

RD. EDGE JOINT OR DRILL FILES

Cut Only on Edges



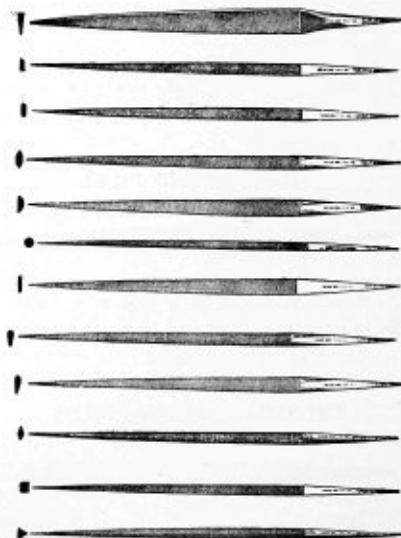
Size, inches	3	4	5	6	8
All Cuts	\$2.50	\$2.70	\$4.05	\$4.40	\$5.85
Thickness { Thin . . . . .	.02	.04	.06	.08	.10
{ Thick . . . . .	.06	.08	.10	.12	.14

5 1/2 INCH NEEDLE FILES With Round Handles



Price per Dozen \$2.10

DIE SINKERS' FILES 3 1/2 Inches Long



Price, Set of 12 \$2.80

FILE HANDLES



Soft Wood with Steel Ferrules

No.	Length, inches	Diameter Ferrule, inches	Diam. Widest Part, inches	Price per Dozen	Price per Gross
1	4	3/8	1 1/4	\$0.25	\$2.25
2	4 1/4	3/8	1 1/4	.30	2.70
3	4 1/2	3/8	1 1/4	.35	3.50
4	4 3/4	1/2	1 3/8	.40	4.00
5	5	1/2	1 3/8	.45	4.50

Hard Wood with Brass Ferrules

No.	Length, inches	Diameter Ferrule, inches	Diam. Widest Part, inches	Price per Dozen	Price per Gross
1	4	3/8	1 1/4	\$0.40	\$3.75
2	4 1/4	3/8	1 1/4	.45	4.50
3	4 1/2	3/8	1 1/4	.60	6.00
4	4 3/4	1/2	1 3/8	.75	7.50
5	5	1/2	1 3/8	.90	8.75

Assortments

Sizes	SOFT WOOD		HARD WOOD	
	Per Doz.	Per Gro.	Per Doz.	Per Gro.
1, 2, 3	\$0.30	\$3.00	\$0.50	\$4.75
1, 2, 3, 4	.35	3.50	.55	5.50
1, 2, 3, 4, 5	.40	4.00	.65	6.25

SPUN FERRULE FILE HANDLES



No.	Length, inches	Diameter Ferrule, in.	Diam. Widest Part, in.	Price per Dozen
1	5 1/2	1 1/4	1 1/2	\$0.80
2	6	1 1/4	1 1/2	.75
3	6 1/2	1 1/4	1 1/2	.70
4	6 3/4	3/4	1 1/2	.65
5	7	3/4	1 1/2	.60

JEWELERS' FILE HANDLES



Brass Ferrules—all Polished

No.	Length, inches	Diameter, inches	Price per Dozen	Price per Gross
1	4 1/4	3/8	\$0.45	\$4.50
2	4 1/2	3/8	.45	4.50
3	4 3/4	3/8	.55	5.50
4	4 3/4	3/8	.55	5.50

FILES DETACHABLE



STUB
FILES
AND
HOLDER
Files
Detachable

Price per set.....\$6.00
Extra Files......35

FILE CARDS



Nicholson's File Card Mounted on Leather



Nicholson's File Card and Brush Mounted on Leather



Colton's Steel Back

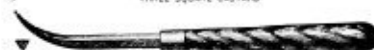


Common Pattern—on Plain Wood Backs

Kind	Price Each	Price per Dozen
Nicholson's File Card.....	\$0.25	\$2.75
Nicholson's File Card and Brush.....	.45	4.90
Colton's Steel Back.....	.25	2.50
Common Pattern.....	.15	1.50

BENT RIFFLERS, HANDLED

THREE SQUARE BASTARD



HAND BASTARD



FLAT FLOAT SAFE SIDES



HALF ROUND BASTARD



THREE SQUARE RASP



ROUND RASP



Price each.....\$0.50

SURFACE FILE HOLDERS



No.	With Hold-Files, Length, inches	Price Each
4	12, 13, 14	\$1.25
5	14, 15, 16	1.50

THE PEERLESS HACK SAW



FASTEST CUTTING HACK SAW MADE

The Peerless blade is fast cutting because of the set and style of the teeth which is something entirely new in the construction of hack saws. The clearance of these blades is perfect. The quality of the steel is the highest possible to obtain—is made and tempered especially for our use, and the durability is equal, if not superior to that of any saw ever produced. There is no such thing as luck in hack saw blades—if the construction and the material is of the best, the quality will be uniform and every blade can be depended upon for service.

THE PEERLESS HACK SAW IS OUR OWN BRAND AND OUR GUARANTEE GOES WITH IT
Made for Hand Frames or Power Machines

FOR HAND FRAMES					FOR POWER MACHINES				
Length, inches	Width, inches	Gauge	Price Dozen	Price Gross	Length, inches	Width, inches	Gauge	Price Dozen	Price Gross
8	1 1/2	23 = .025	\$0.80	\$ 8.00	12	3/4	21 = .032	\$1.50	\$15.00
9	1 1/2	23 = .025	.90	9.00	14	3/4	21 = .032	1.80	18.00
10	1 1/2	23 = .025	1.00	10.00	14	3/4	18 = .049	2.15	21.60
12	1 1/2	23 = .025	1.20	12.00	17	1	18 = .049	3.60	36.00

Blades with 16 teeth (or regular) furnished unless 24 teeth (fine) are ordered.

14 in. Blades for Power Machines are 13 1/2 in. to center of holes.

17 in. Blades for Power Machines are 16 1/2 in. to center of holes.

STARRET'S FLEXIBLE BACK HACK
SAW BLADES



Designed expressly for cutting thin iron and steel, brass and copper tubing and sheet metals.

These blades are manufactured by a new process whereby the tooth edge only is left hard, while the back is drawn to a clock-spring temper, which will permit the saw to bend without kinking or breaking readily.

Length, inches	PRICE	
	Per Dozen	Per Gross
8	\$0.80	\$ 8.00
9	.90	9.00
10	1.00	10.00
11	1.10	11.00
12	1.20	12.00

STAR HACK SAW BLADES



Length, inches	Per Gross	Length, inches	Per Gross
6	\$3.50	10	\$5.00
7	3.75	11	5.50
8	4.00	12	6.00
9	4.50		

UNIVERSAL HACK SAW BLADES

Length, inches	Per Dozen	Per Gross	Length, inches	Per Dozen	Per Gross
6	\$0.70	\$7.00	10	\$1.00	\$10.00
7	.75	7.50	11	1.10	11.00
8	.80	8.00	12	1.20	12.00
9	.90	9.00			

For Power Machines

Length, inches	Width, inches	Thickness Gauge	Per Dozen	Per Gross
12	3/4	21	\$1.50	\$15.00
14	3/4	21	1.80	18.00
14	3/8	18	2.10	21.60
17	1	18	3.60	36.00

No. 10 EXTENSION HACK SAW FRAMES



Adjustable from 8 to 10 inches inclusive, full polished and nickel plated. Each Dozen
Price.....\$0.75 \$7.40

No. 6 STAR HACK SAW FRAME



Adjustable to hold blades from 6 to 12 inches inclusive; will face blades in four directions. Is made stiff and strong with cocobolo handle, highly polished and heavily nickel plated. Each Dozen
Price.....\$1.20 \$12.00

STAR HACK SAW FRAME No. 10

Extension



Made of tempered steel, polished and nickel plated. Handles are cocobolo, highly finished. Carries blades 6, 7, 8, 9, 10, 11 and 12 inches long, and is marked for different lengths. Each Dozen
Price.....\$1.20 \$12.00

EXTRA HEAVY ADJUSTABLE HACK SAW FRAME



Adjustable for blades from 8 to 12 inches inclusive, a heavy rigid frame made from 1/4x3/4 inch stock. Blades can be faced in four different directions. Throat 3 1/2 inches deep. Each Dozen
Price, polished and N. P.....\$1.50 \$15.00
Price, black finish.....1.20 12.00

CAST IRON HACK SAW FRAMES



Cast iron handsomely enameled. Made for 8 inch or 9-inch blades. Each Dozen
For 8-inch blades.....\$0.60 \$6.00
For 9-inch blades......65 6.50
For 10-inch blades......70 7.00
For 12-inch blades......75 7.50

No. 20 STEEL HACK SAW FRAMES



Full polished and nickel plated. Made for 8 inch to 12-inch blades, adjustable to four different angles. Each Dozen
For 8-inch blades.....\$0.60 \$6.00
For 9-inch blades......65 6.30
For 10-inch blades......70 6.60
For 12-inch blades......75 7.20

RAIL HACK SAW



This Saw is Especially Adapted for Cutting off Rails, Large Beams, Girders, Etc.

No.	Under Back, inches	For Blades, inches	PRICE			
			FRAMES		BLADES	
			Each	Dozen	Each	Dozen
1	7	9	\$1.50	\$15.00	\$0.08	\$0.80
2	10	12	1.80	18.00	.10	1.05
3	10	14	1.90	19.00	.12	1.25
4	10	17	2.30	23.00	.15	1.50
5	10	18	2.80	28.00	.18	1.80
6	10	20	3.30	33.00	.20	2.15

Nos. 4, 5 and 6 have handle on each end.

MAGAZINE STAR HACK SAW FRAME



These Frames have magazine backs for the reception of one-half dozen or less Blades.

The backs are made from rectangular tubing and are hollow.

The frames will be found most convenient, enabling one to always find saw blades in an available place.

No. 30 Frame is polished and nicked throughout and the handle is cocobolo wood.

No. 29.....\$15.00
No. 30.....21.00

Above prices do not include blades.

THE MARVEL DRAW CUT HACK SAW

Saws Straight and Fast, Prevents Breaking of Blades and is Instantly Adjustable. The Saving in Time and Blades Thus Effected Soon Repays Cost of the Machine



No. 1



No. 2

The No. 1 has a draw cut; a quick action vise that saves time; a device that raises or lowers saw and holds it at any desired angle allowing free use of both hands in measuring material. It saws close to vise; has an extension to table so material rests on both sides of saw. The wear can be taken up to any extent in the two saw bearings, which have also receptacles for oily waste. Drive shaft has bronze bearing. Starter and automatic stop are at front of machine.

The No. 2 is heavy and exceptionally rigid in construction. Feed lever at top carries tension thumb screw. The same lever raises or lowers saw and holds it in any position, a great convenience in measuring. The quick action, heavy vise swivels both ways so that material can be inserted to cut on an angle either way. The wear can be taken up to any extent in the two saw bearings, which have also receptacles for oily waste. The drive shaft has bronze bearing. Starter and automatic stop are at front of machine. Has adjustable stroke, longest $6\frac{1}{4}$ inches, shortest 4 inches. The entire vise can be instantly removed (leaving a T-slotted table for holding irregular shapes) and makes an excellent tool for clamping work on drill press, etc.

Number	Capacity, inches	Length Blade, inches	Rev. per min.	Weight, lbs.	Price
1	4 x 4	12	60 to 90	110	\$16.75
2	6 x 6 and 8 x 8	12 to 17	50 to 70	260	35.00

THE STAR POWER HACK SAW

It adapts itself to all kinds of work and cuts all shapes and sizes up to $4\frac{1}{2}$ inches in diameter. It is self-feeding, requiring no attention while making a cut, and stops automatically when the work is completed.



It is arranged for blades either 10, 11 or 12 inches in length. Six 12-inch blades are furnished with each machine. The speed recommended is 45 strokes per minute. Size of pulley $1\frac{1}{2} \times 2\frac{1}{4}$ inches. Net weight 108 pounds.

Price, each.....\$25.00

POWER HACK SAW

No. 30

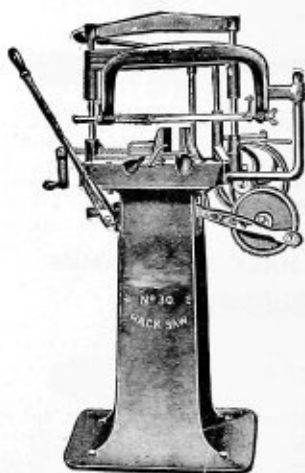
This machine is provided with an adjustable, automatic stop, which can be set to stop the saw at any desired depth, or after the work has been cut completely off, and is instantaneous in its action.

The saw frame runs in a guide at its back, which, in turn, slides up and down upon two perpendicular guide rods, and the traveling motion is conveyed to it by a horizontal guide which runs parallel to the blade of the saw. Particular attention is called to the fact that the saw blade always runs parallel to the bottom of the vise.

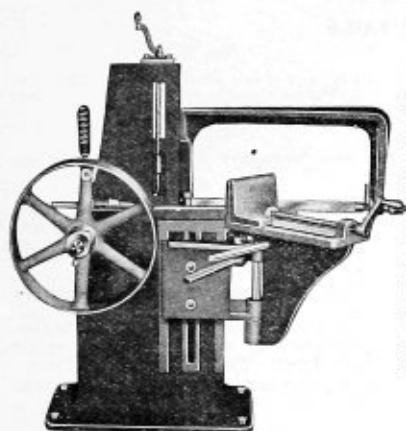
The vise will take in work $4\frac{1}{2} \times 4\frac{1}{2}$ in. and is operated by a handled screw, as shown in the cut. The bed of the vise extends beyond the jaws.

Weight, ..130 pounds

Price, each....\$30.00



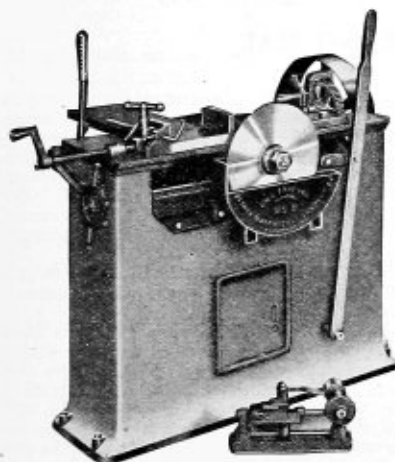
Tight and loose pulley, 6 inches in diameter. Geared 3 to 1. Machine should run 45 to 50 strokes per minute to get best results. Pulley should run 150 strokes per minute.

"Q AND C" SHOP SAWS**No. 4**

The machines are started by a clutch on the driving shaft, thus rendering a counter-shaft unnecessary. A handle can be attached to the pulleys so that it may be run by hand, if desired. It is provided with double saw guides, and will cut perfectly square if properly handled. All rods, guides and shafts are steel, and the machine is well and substantially built.

**No. 3**

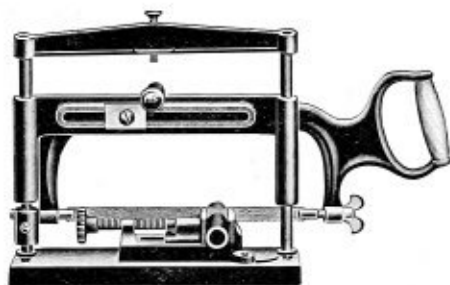
No.	Capacity, inches	Stroke of Saw Blade, inches	Length of Saw Blade, inches	Size of Pulley, inches	Speed Per Minute	Floor Space, inches	Height Over All	Net Weight, pounds	Price Each with Six Blades
1	4x4	6	12	14x2½	50 rev.	18x30	36	136	\$18.75
3	5x6	6	14	14x2½	50 "	18x30	36	180	25.00
4	7x8	6	17	14x3	50 "	12x32	.....	270	50.00

No. 8 CIRCULAR SHOP SAW

Has two speeds—120 or 168 R. P. M.

Has automatic feed, variable from 1/16-inch to 3 inches per minute. Capacity, 3¼x11½ inches. Diameter of saw, 10¾ inches. Size of pulley, 14x3¼ inches. Pulley speed, 150 R. P. M. Floor space, 15x30 inches. Net weight, 435 lbs.

Price, with grinder and two saw blades\$125.00

No. 1 BENCH HACK SAW

It can be readily fastened to any bench, and will pay for itself in a week's time where iron, steel or brass rod or tubing have to be cut off.

It is fitted with a swivel vise, which can be set to saw at an angle.

The machine is made entirely of iron and steel, is carefully constructed, and thoroughly practical in its working. One 9-inch blade is furnished with each machine, which should be strained well in the frame when in use. It is so constructed that 8-inch blades can be used when desired. Weight, 15 lbs.

Price, each.....\$7.00

BRYANT PORTABLE RAIL SAWS



Style Nos. 5 and 6

DETAILS

No. 5 Saw

Diameter of saw blade.....16 inches
 Thickness of saw blade..... $\frac{1}{8}$ inch
 Maximum depth of cut.....6 $\frac{1}{2}$ inches
 Weight.....256 lbs.
 Price, \$125.00

Furnished Complete with Saw Grinder, two Saw Blades and all Necessary Wrenches

No. 5-A Saw

Diameter of saw blade.....16 inches
 Thickness of saw blade..... $\frac{1}{8}$ inch
 Maximum depth of cut.....6 $\frac{1}{2}$ inches
 Weight.....285 lbs.
 Price, \$156.25

Furnished Complete with Saw Grinder, two Saw Blades and all Necessary Wrenches

No. 6 Saw

Diameter of saw blade.....20 $\frac{1}{4}$ inches
 Thickness of saw blade..... $\frac{3}{4}$ inch
 Maximum depth of cut.....9 inches
 Weight.....310 lbs.
 Price, \$156.25

Furnished Complete with Saw Grinder, two Saw Blades and all Necessary Wrenches

No. 6-A Saw

Diameter of saw blade.....20 $\frac{1}{4}$ inches
 Thickness of saw blade..... $\frac{3}{4}$ inch
 Maximum depth of cut.....9 inches
 Weight.....388 lbs.
 Price, \$187.50

Furnished Complete with Saw Grinder, two Saw Blades and all Necessary Wrenches

The Nos. 5 and 6 saws are designed for cutting rails off at right angles to their length only. The No. 5 saw has sufficient capacity for sawing all steam rails up to and including 100 lbs. per yard. The No. 6 saw will practically cut a nine-inch girder rail of any regular section. The saw is secured to the rail by adjustable clamppaws in the base, which are tightened by a screw and lever.

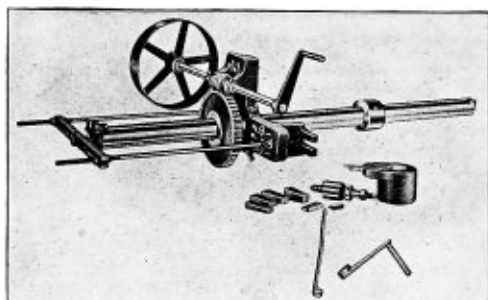
The reducing gearing is arranged on the slide supporting the saw blade, and a simple form of automatic feed lowers the saw at the proper speed for cutting the head or base of the rail. The feed screw is driven by a friction nut, which can be quickly released to feed the saw by hand through the web of the rail or return the slide.

A pawl prevents the saw blade from being turned backwards, which must never be done when in a cut. The Nos. 5-A and 6-A saws are designed for cutting rails off at an angle with their length, and can be set to cut at any angle up to 45 degrees, varying by 5 degrees. The saw blade commences cutting in the center of the head of the rail, and will make a true vertical cut at whatever angle is desired, leaving the ends of the rail perfectly smooth and straight.

The No. 5-A saw has sufficient capacity for cutting all steam rails up to 100 pounds per yard; the No. 6-A will cut all rails up to a 9-inch girder, and is especially valuable for street railway use.

The construction of these saws is similar in other respects to that of Nos. 5 and 6 portable saws, the blade being advanced by an automatic feed, which can be instantly disengaged, allowing the saw to be fed by hand.

PORTABLE CYLINDER BORING BAR



This bar is designed for reboring all sizes of engine cylinders, pumps, air compressors, Corliss valve seats, cranks, large wheels, steam hammer cylinders, etc.

It is designed for boring in place or in a lathe. One end of the bar is held in place by a stationary center bolted to the end of the cylinder and the other end of the bar is held in place by an adjustable center fitted in the stuffing-box. The centers are hardened and will keep true.

The bar can be turned by hand or by a belt from a motor or small engine, and can be used in a horizontal, vertical, or inclined position.

The tool holder or cutter head is fed by a steel screw, which is set in on one side of the bar with a bronze bearing. It has a star feed, which can be regulated according to requirements for rough or finished cuts. We also furnish a wrench for driving the tool

holder or cutter head back. This bar is built to do hard work, and we build any size desired to suit the requirements. We furnish with this bar sufficient tools for the requirements. With inquiry please give the largest and smallest diameter and extreme length you wish to bore.

Size Bar	Size Cylinder	Stroke, Feet	Extra No. Heads	Tools	Weight, Lbs.	Price
2 $\frac{1}{2}$ in. x 5 ft.	4 in. to 10 in.	2 ft. 6 in.	1	4	800	\$318.75
3 $\frac{1}{2}$ " x 5 "	7 " " 18 "	3	1	3	825	331.25
4 " x 5 "	8 " " 24 "	3	2	3	845	337.50
4 " x 8 "	9 " " 24 "	5	2	3	1075	368.75
5 " x 6 "	9 " " 40 "	4	3	4	1125	431.25
5 " x 8 "	9 " " 40 "	5	3	4	1175	450.00
6 " x 6 "	10 " " 50 "	4	4	4	1175	512.50
6 " x 8 "	10 " " 50 "	5	4	4	1350	531.25

Price includes one adjustable center, which fits a stuffing-box 3 $\frac{1}{2}$ in. to 5 $\frac{1}{2}$ in. diameter, or one which fits a stuffing-box 5 $\frac{1}{2}$ in. to 7 $\frac{1}{4}$ in. diameter. Additional adjustable centers, price \$68.75

CHANNON'S HAND, PANEL AND RIP SAWS



OUR "STERLING" BRAND

Special Steel; Full Width Blade; Highly Polished; Full Skew Back; Polished Apple Handle; Five Brass Screws; Fully Warranted

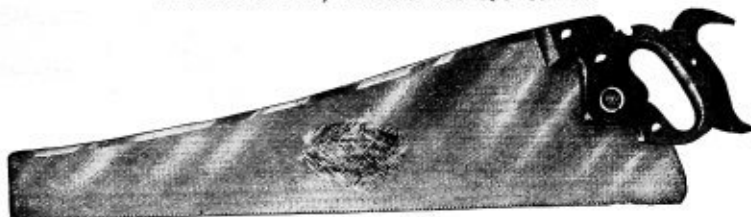
	Panel					Hand	Rip	
Length, inches.....	16	18	20	22	24	26	28	30
Price, each.....	\$ 1.05	\$ 1.35	\$ 1.45	\$ 1.55	\$ 1.65	\$ 1.80	\$ 2.10	\$ 2.40
Price, dozen.....	12.50	16.50	17.50	18.50	19.50	21.00	25.00	28.00

OUR "HELMER" BRAND

Cast Steel; Skew Back; Beech Handle; Polished Edge; Four Brass Screws

	Panel					Hand	Rip	
Length, inches.....	16	18	20	22	24	26	28	30
Price, each.....	\$ 1.05	\$ 1.10	\$ 1.20	\$ 1.25	\$ 1.35	\$ 1.40	\$ 1.60	\$ 1.85
Price, dozen.....	12.50	13.50	14.00	15.00	16.00	16.50	19.00	22.00

ATKINS' HAND, PANEL AND RIP SAWS



No. 400

EXTRA QUALITY AND FINISH

Silver Steel, Skew Back, Mirror Finish, Rosewood Handle, Perfection Pattern, Polished, with four Silver Plated Screws

	Panel					Hand	Rip	
Length, inches.....	16	18	20	22	24	26	28	30
Price, each.....	\$ 3.20	\$ 3.60	\$ 3.90	\$ 4.20	\$ 4.50	\$ 4.80	\$ 5.50	\$ 6.10
Price per dozen.....	38.00	43.00	46.00	50.00	54.00	57.00	66.00	73.00

ATKINS' No. 53 SILVER STEEL

	Panel					Hand	Rip	
Length, inches.....	16	18	20	22	24	26	28	30
Price, each.....	\$ 1.65	\$ 1.85	\$ 2.00	\$ 2.25	\$ 2.45	\$ 2.50	\$ 2.85	\$ 3.25
Price, per dozen.....	19.75	22.00	24.00	27.00	29.00	30.00	34.00	39.00

BISHOP'S HAND PANEL AND RIP SAWS

Extra refined American Spring Steel, selected highly finished blades, full skew back, full taper ground. Apple wood handle highly finished and carved, with five brass screws. Fully warranted.



No. B40

	Panel					Hand	Rip	
Length, inches.....	16	18	20	22	24	26	28	30
Price, each.....	\$ 1.60	\$ 1.80	\$ 2.00	\$ 2.20	\$ 2.35	\$ 2.50	\$ 2.80	\$ 3.10
Price per dozen.....	19.00	21.00	24.00	26.00	28.00	30.00	33.00	37.00

We can also furnish from stock, Rip Saws 26 inches long, taking same list as Hand Saws.
List price per dozen applies only on order for full boxes of one size. Saws are put up in boxes containing one-third dozen.

BACK SAWS



Length, inches	8	10	12	14	16	18
No. 2, Each	\$1.50	\$1.60	\$1.80	\$2.00	\$2.25	\$2.50
No. 2, Per Dozen	15.00	16.00	18.00	20.00	22.50	25.00
No. 3, Each	1.00	1.15	1.35	1.55	1.60	2.00
No. 3, Per Dozen	10.25	11.50	13.50	15.75	16.00	20.25

COMPASS SAWS



Length, inches	10	12	14	16	18
No. 2, Each	\$0.50	\$0.50	\$0.55	\$0.55	\$0.60
No. 2, Per Dozen	5.00	5.25	5.50	5.75	6.00
No. 3, Each	.50	.50	.50	.50	.50
No. 3, Per Dozen	5.00	5.00	5.00	5.00	5.00

INTERCHANGEABLE COMPASS SAWS

Length, inches	10	12	14	16	18	20
Price, Each	\$0.45	\$0.45	\$0.50	\$0.55	\$0.60	\$0.65
Price, Per Dozen	4.50	4.75	5.00	5.25	5.75	6.25
Blade Only, Each	.25	.25	.30	.30	.35	.40
Blades Only, Doz	2.50	2.75	3.00	3.25	3.50	3.75

NESTS OF SAWS



No. 1

Handle and Screws	Price, Each	\$0.20
Keyhole Blades, 12 inches long	"	.20
Compass Blades, 14 inches long	"	.30
Pruning Saws, 18 inches long	"	.55
Total for Nest		1.25

No. 2

Handle and Screws	Price Each	\$0.20
10-inch Keyhole Blades	"	.20
12-inch Compass Blades	"	.25
16-inch Compass Blades	"	.35
Total for Nest		\$1.00

SWAGE JUMPER OR UPSET, FOR SAWS



No. 0. for large Circular Saws	\$3.50
No. 1. for large Circular Saws	3.00
No. 2. for small Circular and Mill Saws	2.50
No. 3. for small Circular Saws	2.00

CIRCULAR SAW MANDRELS



Style A. With Pulley on End



Style B. With Pulley in Center

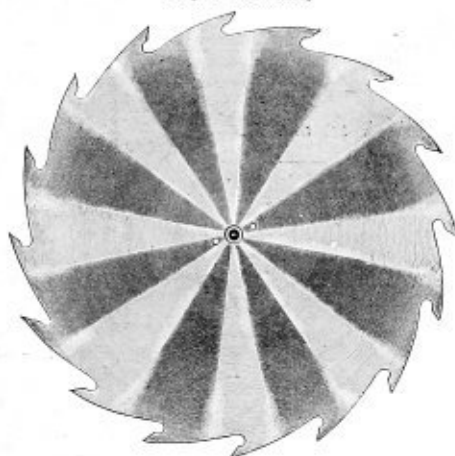
No.	Diameter of Pulley, Inches	Face of Pulley, Inches	Diameter of Flange, Inches	Diameter of Shaft, Inches	Size of Hole in Saw, Inches	Length of Shaft, Inches	Price Each
1	2 1/2	3 1/2	2 1/2	1 1/8	1	16 1/2	\$ 7.70
2	3	4	3	1 1/8	1 1/8	19	8.50
3	3 1/2	4 1/2	3 1/2	1 1/8	1 1/4	21 1/2	9.00
4	4	5	4	1 1/8	1 1/2	24	10.75
5	4 1/2	5 1/2	4 1/2	1 1/8	1 3/8	26	12.00
6	5	6	5	1 1/8	1 3/8	28	13.75
7	5 1/2	6 1/2	5 1/2	1 1/8	1 3/8	30 1/2	15.00
8	6	7	6	1 1/8	1 1/2	32 1/2	19.50
9	7	8	6	1 1/8	1 5/8	37	23.50
10	8	8	6	1 1/8	1 5/8	41	28.00

These Saw Mandrels are of the latest approved pattern, made in a thoroughly workmanlike manner from high grade, cold drawn steel shafting and best quality grey iron castings. Boxes are filled with high speed babbitt metal, most suitable for this purpose, and are parted for taking up wear.

NOTE—Our mandrels are made with the pulley on right-hand side when saw is running toward you, with left-hand thread, unless otherwise ordered. In ordering, specify either Style "A" or Style "B."

CIRCULAR SAWS

Patent Ground and Tempered Solid Tooth Circular Saws, of Extra Quality, Superior Workmanship, and Guaranteed as per Warranty



When ordering, be particular to state whether Rip or Cross Cut is wanted, diameter of saw in inches, right or left hand, and size of mandrel hole.

Diam., inches	Thick-ness, Gauge	Size of Hole, inches	Price Each	Extra for each additional Gauge Heavier	Setting and Sharpening Cross-Cut Circular Saws	Diam., inches	Thick-ness, Gauge	Size of Hole, inches	Price Each	Extra for each Additional Gauge Heavier	Setting and Sharpening Cross-Cut Circular Saws
1	24	3/8			\$0.20	32	10	1 5/8	\$22.00	\$1.00	\$2.15
1 1/2	24	3/8			.22	34	9	1 5/8	25.00	1.20	2.35
2	23	3/8			.24	36	9	1 5/8	28.00	1.40	2.55
2 1/2	22*	3/8			.27	38	9	1 5/8	31.00	1.75	2.75
3	21	1 1/2			.30	40	9	2	36.00	2.00	2.95
3 1/2	20	1 1/2			.33	42	8	2	42.00	2.50	3.15
4	19	3/4			.36	44	8	2	50.00	3.00	3.35
5	19	3/4			.40	46	8	2	60.00	3.50	3.60
6	18	3/4	\$ 1.55	\$ 0.05	.45	48	8	2	70.00	4.00	3.85
7	18	3/4	1.85	.06	.50	50	7	2	80.00	4.50	4.10
8	18	7/8	2.20	.08	.55	52	7	2	90.00	5.00	4.40
9	17	7/8	2.75	.10	.60	54	7	2	100.00	6.00	4.70
10	16	1	3.30	.12	.65	56	7	2	115.00	7.00	5.00
11	16	1	3.80	.14	.70	58	7	2	130.00	8.00	5.30
12	15	1	4.15	.17	.75	60	6	2	145.00	9.00	5.60
14	15	1 1/8	5.00	.21	.85	62	6	2	160.00	10.00	5.90
16	14	1 1/8	6.00	.25	.95	64	6	2	180.00	12.00	6.20
18	13	1 1/4	7.50	.30	1.05	66	6	2	200.00	15.00	6.50
20	13	1 1/4	9.00	.35	1.15	68	5	2	225.00	18.00	6.80
22	12	1 1/4	11.00	.45	1.30	70	5	2	255.00	21.00	7.10
24	11	1 3/8	13.00	.55	1.45	72	5	2	290.00	24.00	7.40
26	11	1 3/8	15.00	.65	1.60	74	5	2	330.00	27.00	7.70
28	10	1 1/2	17.00	.80	1.75	76	5	2	375.00	30.00	8.00
30	10	1 1/2	19.00	.90	1.95						

See note below.

†Saws from 1 to 5-inch diam., are special and made to order at Factory only.

No extra charge for saws one gauge thicker than list.

Saws 38 inches and under beveled one gauge without extra charge.

Saws 40 inches and over beveled two gauges without extra charge.

Saws 48 inches in diameter and larger, thinner than ten gauge, add ten per cent for each gauge thinner, and no warrant.

Circular Saws for Bone, Ivory or Metal, not hollow ground, advance above list 25 per cent.

Note.—Saws 40 inches and over are filed and set or swaged ready for use without extra charge.

Price for beveling new saws and grinding or beveling old saws will be quoted upon application. *

NARROW BAND SAWS

For Re-Sawing and Scroll Sawing



Note—These saws are not joined, set and filed, unless so ordered.

Width, inches	Stand. Gauge	Stand. Teeth Points	Brazing Extra	Price per foot
$\frac{1}{8}$	23	8	40	\$0.07
$\frac{3}{8}$	23	7	40	.08
$\frac{1}{4}$	22	6	40	.09
$\frac{3}{8}$	22	$5\frac{1}{2}$	40	.10
$\frac{1}{2}$	21	5	40	.11
$\frac{5}{8}$	21	$4\frac{1}{2}$	50	.13
$\frac{3}{4}$	21	4	50	.15
$\frac{7}{8}$	21	4	60	.17
1	20	$3\frac{1}{2}$	60	.19
$1\frac{1}{8}$	20	$3\frac{1}{2}$	60	.21
$1\frac{1}{4}$	20	$3\frac{1}{2}$	80	.23
$1\frac{3}{8}$	20	3	80	.26
$1\frac{1}{2}$	20	3	80	.29
$1\frac{3}{4}$	20	3	90	.32

Filing and setting 4 cents per foot extra.

Narrow Band Saws with beveled backs, advance list 50 per cent for first gauge and 10 per cent for each additional gauge.

For Band Saws with knife edge, add 10 cents per foot to list.

Always state full particulars when ordering.

WIDE BAND SAWS



Width, inches	Usual Gauge	Price per Foot	Width, inches	Usual Gauge	Price per Foot
2	18 to 20	\$0.80	6	17 to 19	\$ 2.40
$2\frac{1}{2}$	18 to 20	1.00	8	14 to 16	3.20
3	18 to 20	1.20	10	14 to 16	4.00
$3\frac{1}{2}$	18 to 20	1.40	12	13 to 15	5.00
4	17 to 19	1.60	14	13 to 15	7.00
5	17 to 19	2.00	16	12 to 14	10.00

All band saws 6 inches and wider are made from special aluminum steel, and are hardened and tempered by special process. Every saw is joined, filed, set and fitted, ready to go on the mill without further hammering.

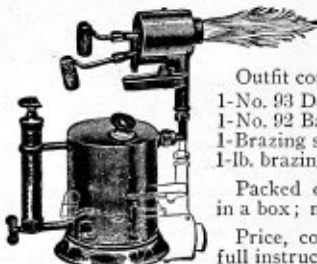
Band saws thinner than 22 gauge, add 20 per cent to list. Double Edge band saws, advance list 10 per cent.

GASOLINE BAND SAW BRAZING OUTFIT

The holder for clamping saws may be placed in a vise or screwed to a bench. The brazing torch is exactly suited for brazing band saws, as the flame is a small concentrated pointed flame of intense heat, which makes the braze in a few seconds. The brazing mixture is specially prepared for band saw work and will be found of superior quality. Saws up to $1\frac{1}{4}$ inches are easily and quickly brazed in a permanent manner.



No. 92
Band Saw
Clamp



No. 93 Torch

Outfit consists of:

- 1-No. 93 Double jet torch.
- 1-No. 92 Band saw clamp.
- 1-Brazing spoon.
- 1-lb. brazing compound.

Packed one complete outfit in a box; net weight 10 lbs.

Price, complete outfit, with full instructions.....\$12.50

SILVER SOLDER

This solder has proven to be the best adapted for brazing tempered steel.

Put up in tin boxes of 1 oz each $\frac{3}{4}$ inch wide x .003 thick, per oz.....\$1.00



MORRILL'S SAWSETS



No. Special for hand panel and rip saws from widest made down to $\frac{1}{2}$ inch wide.

Nos. 3 and 4 for cross cut and circular saws, single tooth from 14 to 20 gauge.

No. 10 for band saws down to $\frac{1}{8}$ inch wide not over 16 gauge.

No.	Length, inches	Price Each	Price Dozen
Special	6 $\frac{3}{4}$	\$1.55	\$15.60
No. 3	9	2.00	20.00
" 4	9	2.00	20.00
" 10	6 $\frac{3}{4}$	1.55	15.60

CROSS-CUT SAWS

GLEAT AMERICAN TOOTH



LIST PRICES WITHOUT HANDLES

Length, feet.....	4	4½	5	5½	6	6½	7	7½	8
Regular gauge, 14x16 gauge.....	\$1.84	2.08	2.30	2.54	2.76	3.00	3.22	3.46	3.68
Thin-back, 14x18 gauge.....	2.00	2.26	2.50	2.76	3.00	3.26	3.50	3.76	4.00



Special High Grade Steel

Length, feet.....	4	4½	5	5½	6	6½	7	7½	8
Price each, without handles.....	\$1.12	1.26	1.40	1.54	1.68	1.82	1.96	2.10	2.24

ONE-MAN CEDAR KING



3 ft.	3½ ft.	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.
\$2.40	2.80	3.20	3.60	4.00	4.40	4.80

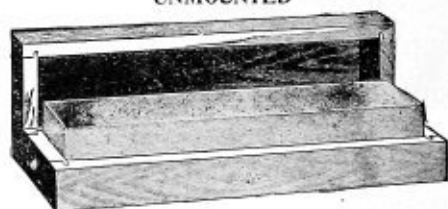


3 ft.	3½ ft.	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.
\$1.80	2.10	2.40	2.70	3.00	3.30	3.60



OIL STONES

ARKANSAS OR WASHITA MOUNTED AND UNMOUNTED



GENUINE ARKANSAS

Size, inches	MOUNTED		UNMOUNTED
	Each	Per Dozen	Price per Lb.
3½ x 1	\$0.90	\$ 9.00	\$2.80
6 x 2	3.00	30.00	3.50
8 x 2	4.00	40.00	.....

WASHITA LILY WHITE

Size, inches	MOUNTED		UNMOUNTED
	Each	Per Dozen	Price per Lb.
3½ x 1	\$0.60	\$ 6.00	.....
6 x 2	1.15	11.50	.....
8 x 2	1.40	14.00	.....

ROUND EDGE SLIPS



Genuine Arkansas—3 in. to 5 in. x 1¼ in. to 2 in. x ¾ in. to ¾ in., back x ¾ in. to ¾ in., edge. Price per pound.....\$4.00
 Washita, Lily White—Same sizes as above.
 Price per pound..... .90

PEN-KNIFE PIECES



Genuine Arkansas—3 in. to 4½ in. x 1 in. to 1¼ in. x ¾ in. to ¾ in. Price per pound.....\$4.00
 Washita, Lily White—3 in. to 5 in. x 1 in. to 1¼ in. x ¾ in. to ¾ in. Price per pound..... .90

ARKANSAS FILES



SQUARE

Size, inches	PRICES	
	Each	Per Doz.
3 to 4½ x ¼	\$0.35	\$3.50
3 to 4½ x ¾	.45	4.50

ROUND

3 to 4½ x ¼	\$0.80	\$8.00
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FLAT

3 to 4½ x ¾ to ¾	\$0.40	\$4.00
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BEVEL

3 to 4½ x ¾ to ¼	\$0.45	\$4.50
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INDIA OIL STONES



The India Stone is the hardest, yet the fastest cutting oil stone made, it is made of pure corundum in all shapes and sizes in which oil stones are regularly manufactured, coarse, medium and fine grits.

The coarse stone is a hustler, most in demand for work where speed is considered before fine finish. These stones should not be used dry. Soak thoroughly in thin, clear oil.

The medium stone, though coarser in grain than the fine stone, still makes a good working edge on all ordinary tools in every-day practice, and will compare favorably with all other medium stones in common use.

The fine stone is fast cutting and close grained, leaving a smooth, keen edge on the hardest and finest of steel tools.

PRICE EACH

No.	Dimensions	Coarse, Medium or Fine
0	8x2x1	\$1.00
2	6x1½x¾	.50
3	4x1x½	.30
4	4x½x¾	.30
6	4x¼x¾	.30
8	4x¾x¾	.40
11	4x¾	.45
13	4½x1¾x1½x¾	.35
14	4½x1¾x1½x¾	.35
15	4½x1¾x1¾x¾	.35
29	6x2x1	.60

MOUNTED

In Polished Wood Cases
PRICE EACH

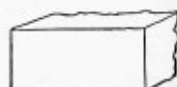
No.	Dimensions	Coarse, Medium or Fine
0	8x2x1	\$1.25
2	6x1½x¾	.75
3	4x1x½	.55
29	6x2x1	.85

COMBINATION STONES

These stones are furnished with one face, medium and one face coarse grade.

No.	Dimensions	PRICE EACH	
		Plain	Mounted
0	8x2x1	\$1.25	\$1.50
29	6x2x1	.75	1.00

SHAPES OF INDIA STONES



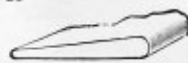
Nos. 0 to 6 and 29



No. 8



No. 11



Nos. 13 to 15

NORTON GRINDING WHEELS

Made of Alundum



The principal abrasive now used in these wheels is Alundum, which is manufactured by Norton Company at Niagara Falls, N. Y., by an electrical process.

The requisites sought for and attained in this abrasive are extreme hardness and sharpness combined with uniformity and proper temper.

Norton Wheels are manufactured by vitrified, elastic and silicate processes. They are made in all shapes and sizes, and for all classes of work.

PRICE LIST OF SOLID EMERY AND CORUNDUM WHEELS.

Diam. inches	THICKNESS OF WHEELS, INCHES.																Revs. per minute
	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4	
1	\$0.25	\$0.30	\$0.30	\$0.35	\$0.35	\$0.40	\$0.45	\$0.50	\$0.55	\$0.60	\$0.65	\$0.70	\$0.75	\$0.80	\$0.85	\$0.90	18,000
1 1/2	.30	.35	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	14,000
2	.35	.45	.50	.55	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	10,000
2 1/2	.40	.55	.65	.70	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.85	2.05	8,500
3	.50	.65	.80	.90	.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.60	2.90	7,000
3 1/2	.60	.80	.95	1.05	1.15	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.35	3.75	6,035
4	.75	.95	1.10	1.25	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	4.10	4.60	5,300
4 1/2	.90	1.10	1.25	1.40	1.55	1.85	2.15	2.45	2.75	3.05	3.35	3.65	3.95	4.25	4.85	5.45	4,700
5	1.00	1.20	1.40	1.60	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	6.20	7.00	4,200
6	1.40	1.60	1.75	2.10	2.40	3.05	3.70	4.35	5.00	5.65	6.30	6.95	7.60	8.25	9.55	10.85	3,500
7	1.85	2.00	2.15	2.60	3.00	3.85	4.70	5.55	6.40	7.25	8.10	8.95	9.80	10.65	12.35	14.05	3,000
8	2.10	2.35	2.60	3.10	3.60	4.60	5.60	6.60	7.60	8.60	9.60	10.60	11.60	12.60	14.60	16.60	2,600
9	2.50	2.80	3.10	3.70	4.25	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	16.90	19.20	2,300
10	3.00	3.35	3.65	4.35	5.00	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	19.85	22.55	2,100
12	3.60	3.80	4.00	5.00	6.00	7.40	9.00	10.70	12.75	14.00	15.70	17.40	19.00	20.75	24.25	27.50	1,750
14	4.05	5.15	6.25	7.35	8.45	10.60	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	32.62	37.05	1,500
16	.....	.....	.....	.....	10.85	13.70	16.55	19.40	22.28	25.00	27.95	30.80	33.65	36.50	42.20	47.90	1,300
18	.....	.....	.....	.....	13.25	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	54.50	62.00	1,150
20	.....	.....	.....	.....	.....	20.25	24.75	29.25	33.75	38.25	42.75	47.25	51.75	56.25	65.25	74.25	1,050
22	.....	.....	.....	.....	.....	25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	85.00	97.00	950
24	.....	.....	.....	.....	.....	29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00	85.00	99.00	113.00	850
26	.....	.....	.....	.....	.....	.....	43.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	115.00	131.00	775
30	.....	.....	.....	.....	.....	.....	.....	61.00	72.00	83.00	94.00	105.00	116.00	127.00	149.00	171.00	705
36	.....	.....	.....	.....	.....	.....	.....	95.00	110.50	126.00	141.50	157.00	172.50	188.00	219.00	250.00	520

One-fourth to one-half less speed for tool grinding.

Special catalog sent on request covering special shapes for Brown & Sharpe and other makes of grinding machines, also suggestions covering speeds, truing, mounting and tables for selection of grades.

PYKO PEERLESS GRINDERS



Pyko Peerless



Pyko Peerless Junior



Pyko Peerless Midget

Pyko Peerless—Powerful and compact; noiseless, smooth running and adapted to a wide range of work. Has tool rest and chisel, shear, drill and skate grinding guides. Readily carried in tool box.

Pyko Peerless Junior—Same pattern as the Peerless, but smaller in size. Has tool rest and chisel, shear, drill and skate grinding guide. Strictly first-class in every respect and very serviceable for general grinding.

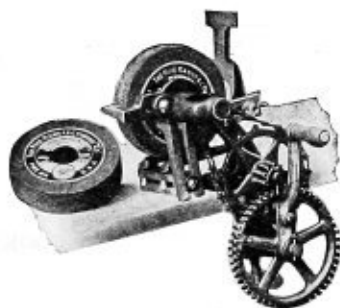
Pyko Peerless Midget—For grinding shears, penknives, erasers and other small tools used in schools, offices or homes. Has cut gears, universal tool rest and pencil sharpener attachment.

Name	Height, inches	Length, inches	Size of Wheel, inches	Weight, lbs.	Price Complete	Foot Power, Extra	Polishing Outfit, Extra	Extra for Nickel Plated
Peerless.....	13	12½	6x1¼	15	\$6.00	\$1.50	\$1.00	.....
Peerless Junior.....	9	8	4x1	12	4.00	1.50	1.00	\$4.50
Peerless Midget.....	6	5½	3x¾	4	3.00	....	....	3.25

PYKO GRINDERS



Pyko No. 1



Pyko No. 2A



Pyko No. 3A

No. of Grinder	Height, inches	Width, inches	Size of Wheel	PRICE EACH		Buffing Outfit Extra	Extra Wheel, Each	Weight, lbs.
				Enamel	Nickel Plate			
1	8½	5½	3x¾x¾	\$1.50	\$2.00	.....	.....	2
2A	10½	8	4x1x1	3.00	4.00	\$1.00	\$0.75	5½
3A	16½	11	6x1¼x1	6.00	.....	1.00	1.00	11

No. 1 Grinder—For sharpening knives, scissors and small tools of all kinds. Weighs less than 2 lbs. and can be clamped instantly to any table, desk or shelf.

No. 2A Grinder—A simple, efficient, low priced grinder for carpenters and mechanics. Convenient for the tool chest and can be instantly attached to bench or table. Is equipped with coarse grit wheel for grinding large tools, also chisel and plane bit guide.

No. 3A Grinder—A powerful grinding machine, doing practically as wide a range of grinding as a power machine of equal dimensions. For wood working, machine and blacksmith shops or any place a power machine is not available. Has coarse wheel for grinding heavy tools, castings, etc. Chisel and plane bit guide.

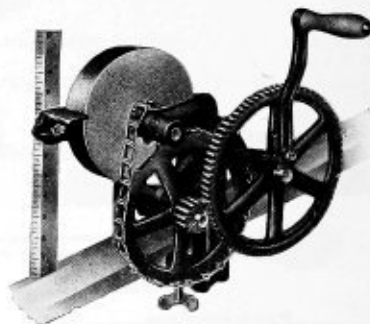
HAND GRINDERS



Princess



"Bull Dog" No. 2



"Giant"

Name	Size of Wheel inches	Shipping Weight, lbs.	Equipment	Price, Each
Princess	5 x 1½	8	Patent tool rest regularly supplied	\$ 4.50
Bull Dog No. 1 ...	6 x 1¼	22	Chisel and drill grinding attachment; hone Chisel and drill attachment, 8 plane bit guide	5.50
Bull Dog No. 2 ...	6 x 1¼	24		7.00
Giant	7 x 1¼	35		15.00

The Princess Grinder: A moderate priced machine for general small tool grinding. Enclosed gears; adjustable to a vertical or horizontal position so that either side or face of wheel can be used. Has brass worm gear. A strictly first-class and very serviceable grinder.

The "Bull Dog" Grinder is powerful enough to take care of the heaviest work that can be done on a hand-power grinder and delicate enough to handle the finest edged tools. Tool rest is adjustable to almost any angle and clamping device will take hold of any bench or plank up to three inches.

The "Giant" Diamond Grinder—A substantial, practically indestructible machine designed to meet the requirements of contractors, etc., on work where power machines are not within reach. Castings are extra heavy and all breakable parts are malleable. Tool rest adjustable to any angle desired and clamping device will grasp any plank or bench from one to four inches.



COOK'S "MAGIC" GRINDER

A strictly high-class machine for all kinds of grinding; gears are machine cut and run in oil. Adjustable rest for edge tools and twist and flat bit drill grinding attachments furnished. Pinions carrying wheel are very heavy and run in bronze bushings. Entire machine built for long wear and heavy service. Regular size wheels are 7x1 inch but will carry up to 8x2 inches. Price, each\$20.00

THE HUMMER DIAMOND TOOL GRINDER

A practical foot power tool grinder that will not need repairing and has ample power for all purposes. In every way equal to a power machine carrying wheels of the same size. Dust proof and self oiling; carries two 7 x 1 1/4 wheels; tool rests are adjustable in any direction; has chisel and plane bit guide independent of regular tool rests. Height 40 inches from floor; distance between wheels 8 1/2 inches; shipping weight, 68 lbs; will carry wheels up to 10 inch diameter.



No. 2 Machine with Column

Price Each..... \$15.00



BENCH GRINDERS

With Adjustable Bearings and Oil Cups

No.	Size Wheels will Take (2 Wheels)	Size Arbor, inches	Size Pulley, inches	Weight, pounds	For Countershaft	Price Each
1	6 x 1	10 x 5/8	2 x 1 1/2	10	No. 1	\$ 5.00
2	10 x 1 1/2	13 x 7/8	2 1/2 x 2	20	No. 2	10.00
3	12 x 1 1/2	18 x 1 1/8	4 x 2 1/2	40	No. 3	15.00
4	16 x 2 1/2	26 x 1 5/16	5 x 4	75	No. 4	20.00

No. 1 Grinder is Plain without Rests. Nos. 2, 3 and 4 Grinders are like cut. All can be equipped with column or used as a bench grinder as desired. For prices on grinding wheels, see index.

GRINDING MACHINE COLUMNS

For Use with Bench Grinders

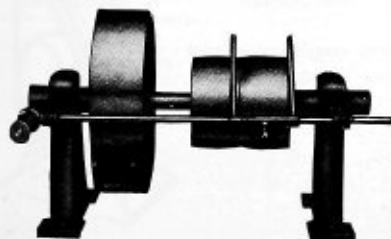
No.	Height, inches	Weight, pounds	Suitable for Grinders	Price each, including Pan
1	32	55	No. 1	\$ 7.50
2	32	55	No. 2	7.50
3	32	70	No. 3	11.00
4	32	90	No. 4	15.00



Nos. 2, 3 and 4 Grinders

COUNTERSHAFTS

No.	Shaft, inches	PULLEYS		Price
		Tight and Loose, inches	Drive, inches	
1	3/4	4 x 2	8 x 2	\$ 5.00
2	1	5 x 2 1/2	10 x 2 1/2	7.50
3	1 1/4	6 x 3	12 x 3	10.00
4	1 1/2	6 x 3	12 x 3 1/2	11.00



BENCH TOOL GRINDER



This machine is designed to meet demand for a small wet tool grinder, requires only 22x16 inches bench space

Spindle between flanges, 1 inch.

12x1½-inch wheel furnished at additional regular list price.

Price of machine without wheel.....\$27.00

Price countershaft. 10.00

"NEW YANKEE" DRILL GRINDER

Readily adjustable to grind any required clearance.

Holder needs no adjustment except to follow wear of the wheel, therefore saves time and trouble.

Drills ground on these machines stand a high rate of speed, require light feed pressure, produce clean cut chips, make true straight holes, and run a long time between grindings.

No.	Capacity, inches	Size Wheel, inches	Size Drive Pulley, inches	Size T & L Pulley, inches	Height, inches	Space Occupied, feet	Weight, lbs.	Price Each
A	⅝-2¼	9½	15x2¼	7½x2¼	42	1½x3	215	\$130.00
A Pt.	⅝-2¼	9½	15x2¼	7½x2¼	42	1½x3	235	135.00
J A	¾-1¼	9½	15x2¼	7½x2¼	42	1½x3	205	125.00
J A Pt.	¾-1¼	9½	15x2¼	7½x2¼	42	1½x3	225	130.00
B	⅝-2¼	9½	12x2¼	6 x2¼	42	1½x3	230	130.00
B Pt.	⅝-2¼	9½	12x2¼	6 x2¼	42	1½x3	250	135.00
K	¾-1¼	7	12x2¼	6 x1¾	14	1 ft. sq	100	96.00



Style A

WET TOOL GRINDER

Water elevated and distributed to wheel by means of a patented air jet.

Machine is simple and cannot get out of order.

It is impossible for water to escape from pan to floor.

No pump or packed joints to get out of order.

Absolutely clean; no accumulation of dirt or sediment from the wheel.



Size Wheel, inches	Speed of Countershaft	Weight, lbs.	Price Each
16x1½	375	400	\$134.00
24x2	325	800	182.00

No. 012 VELOX EMERY GRINDER

Has rigid angle steel frame; adjustable ball bearings; adjustable combination tool rests; 6x¾-inch emery wheel and polishing wheel. It combines proper speed and power, is noiseless in action and has no vibration. Extensively used by carpenters, plumbers, machinists, farmers, and in small repair shops.

Price each, complete.....\$10.00

Weight, crated......66 lbs.





NORTON GRINDING MACHINES

Machines $2\frac{1}{4}$ inches and smaller furnished with either single or cone pulleys. Always specify kind wanted. We can also furnish the following attachments on both style machines if desired: Protection hoods, surface grinding attachments, and water attachment. Prices on extras furnished on application.

BENCH GRINDERS

Size	Price of Machine	Price of Countershaft	Price of Pedestal	Distance Between Wheels, inches	Length of Bearing, inches	Diameter of Spindle in Bearings, inches	Size of Wheels	Countershaft
$\frac{1}{2}$	\$ 6.00	\$10.00	\$10.00	$7\frac{1}{8}$	$2\frac{3}{8}$	$\frac{3}{8}$	6x1	No. 1
$\frac{3}{8}$	10.00	10.00	10.00	$10\frac{1}{8}$	$3\frac{1}{2}$	$\frac{3}{4}$	8x1	No. 1
$\frac{3}{4}$	13.50	13.50	13.50	$15\frac{1}{4}$	$3\frac{3}{4}$	$\frac{7}{8}$	$10 \times 1\frac{1}{2}$	No. 2
1	25.00	13.50	13.50	$17\frac{3}{8}$	4	$1\frac{1}{8}$	12x2	No. 2
$1\frac{1}{4}$	40.00	19.00	.....	$22\frac{7}{8}$	6	$1\frac{3}{8}$	$14 \times 2\frac{1}{2}$	No. 4

FLOOR GRINDERS

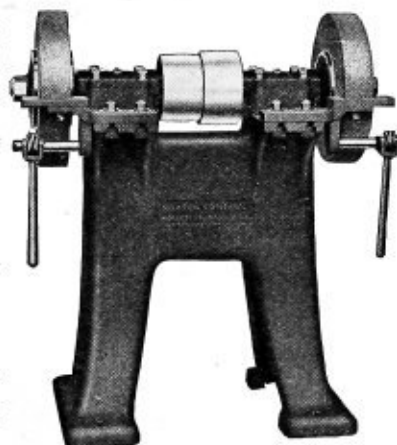
Size	Price of Machine	Price of Countershaft	Distance Between Wheels, inches	Length of Bearing, inches	Diameter of Spindle in Bearings, inches	Size of Wheels	Countershaft	Height of Floor to Center of Spindle, inches
$1\frac{1}{4}$	\$ 55.00	\$19.00	$22\frac{7}{8}$	6	$1\frac{3}{8}$	$14 \times 2\frac{1}{2}$	No. 4	36
$1\frac{1}{2}$	70.00	23.00	$27\frac{7}{8}$	$7\frac{1}{8}$	$1\frac{5}{8}$	16x3	No. 5	34
$1\frac{3}{4}$	85.00	27.00	34	9	$1\frac{7}{8}$	$20 \times 3\frac{1}{2}$	No. 6	$47\frac{1}{2}$
2	100.00	30.00	$43\frac{1}{2}$	12	$2\frac{1}{8}$	24x4	No. 7	30
$2\frac{1}{4}$	112.50	30.00	$43\frac{1}{2}$	12	$2\frac{3}{8}$	30x4	No. 7	30
3	290.00	60.00	$56\frac{3}{4}$	13	$3\frac{1}{8}$	.....	No. 8	28

Prices do not include wheels.

PEDESTALS

Floor stands for bench grinders $\frac{1}{2}$ -inch to $1\frac{1}{4}$ -inch. Height $32\frac{1}{2}$ inches; top plate $10\frac{1}{2} \times 13\frac{3}{4}$ inches.

Floor space occupied, 16 x 18 inches. Price each.....\$10.00

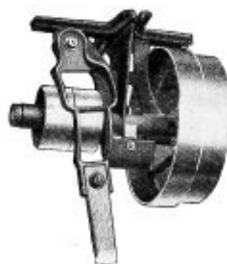


BENCH AND FLOOR GRINDER

COUNTERSHAFTS

We specially recommend these Countershafts to be used in connection with our bench, floor and drill grinding machines.

Description	No. 1.	No. 2.	No. 4.	No. 5.	No. 6.	No. 7.
	Inches	Inches	Inches	Inches	Inches	Inches
Dim'n large driving pulley.	$12 \times 2\frac{3}{8}$	$16 \times 2\frac{3}{8}$	$17\frac{1}{2} \times 3\frac{1}{4}$	$17\frac{1}{2} \times 4\frac{1}{2}$	$16\frac{1}{4} \times 4\frac{3}{4}$	$14\frac{1}{8} \times 5\frac{3}{4}$
" small "	.....	$15\frac{1}{4} \times 2\frac{3}{8}$	$16\frac{1}{4} \times 3\frac{1}{4}$	$16\frac{1}{4} \times 4\frac{1}{4}$	$15\frac{3}{4} \times 4\frac{3}{4}$	$13\frac{3}{4} \times 5\frac{3}{4}$
" tight and loose "	$5 \times 2\frac{3}{4}$	$5\frac{3}{4} \times 2\frac{3}{4}$	$7\frac{3}{4} \times 3\frac{3}{4}$	$7\frac{3}{4} \times 4\frac{3}{4}$	$9\frac{3}{4} \times 5$	$9\frac{3}{4} \times 6$
Diameter of shaft.....	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$
Length of ".....	$15\frac{1}{4}$	21	36	40	42	48
Price each.....	\$10.00	\$13.50	\$19.00	\$23.00	\$27.00	\$30.00

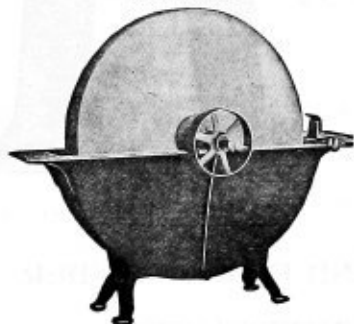


LOOSE GRINDSTONES



All diameters and thicknesses and suitable grits for every variety of grinding. These stones are all made with parallel sides and are of highest finish and quality.

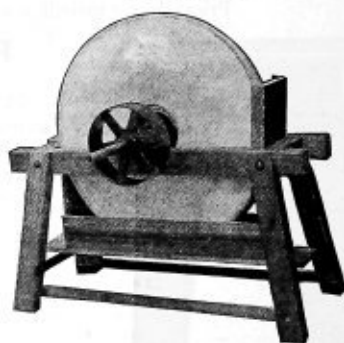
Weight, pounds	Thickness, inches	Price per 100 pounds	Weight	Thickness, inches	Price per 100 pounds
20 to 40	1½ to 2	\$5.00	130 to 350	2 to 3	\$4.50
40 to 60	1¾ to 2¼	3.50	350 to 500	2½ to 5	6.00
60 to 130	2 to 2½	3.00			

KEYSTONE IRON FRAME GRINDSTONES
For Power

Trough cast in one piece making it water tight; legs are cast separate and securely fastened with two wrought iron bolts. Adjustable tool rest with drip pan furnished with every frame.

No.	Diameter of Stone, inches	Thickness of Stone, inches	Size of Shaft at Bearings, inches	PRICE EACH	
				Complete with Stone	Frame with Shaft, Pulley and Tool Rest
1	50	8	1¾	\$58.00	\$35.00
2	48	6	1½	48.00	35.00
3	46	5	1½	42.00	35.00
4	40	6	1½	38.00	26.00
5	38	5	1½	34.00	26.00
6	36	4½	1¼	32.00	26.00
7	30	4	1	25.50	22.00
8	30	3	1	24.50	22.00

Twelve inch pulley regularly furnished with all sizes of "Keystone" frames. Pulleys of any required size furnished at the actual difference in cost.

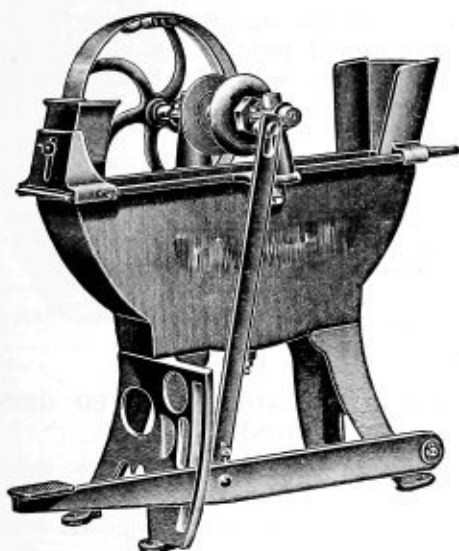
WOODEN FRAME GRINDSTONES
For Power

Frames strongly made of seasoned oak, securely braced in every direction and firmly bolted together. Stones and frame can be shipped separately. Stone is bored and fitted so that it will run true when shaft is replaced.

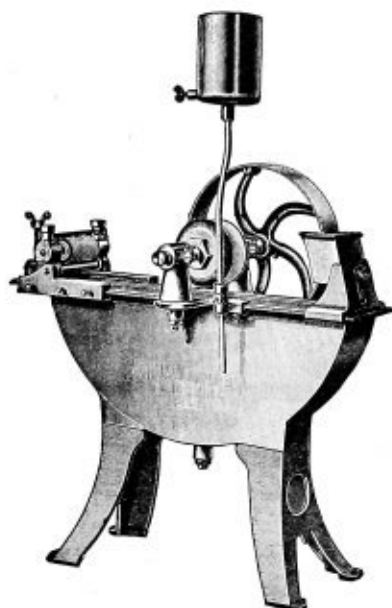
No.	Size of Stone, inches	Price of Frame	Frame and Shaft	Complete with Stone
5	24 x 3	\$ 6.00	\$13.50	\$15.00
6	30 x 4	7.50	15.00	18.00
7	36 x 4½	8.50	17.00	22.00
8	42 x 5	9.00	17.50	25.00
9	48 x 6	10.00	22.00	35.00
10	54 x 7	13.00	28.00	45.00
11	60 x 8	18.00	34.00	55.00

Above prices do not include pulleys.
Nos. 5, 6, 7 and 8 will hang stones 6 inches thick.
Nos. 9, 10 and 11 will hang stones 8 inches thick.

ATHOL IRON GRINDSTONE FRAMES



No. 156
With Water Guard and Adjustable Tool Rest



No. 157
With Adjustable Tool Rest, Truing Attachment and Water Pot

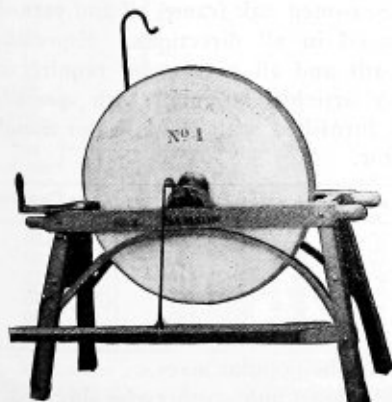
No. 156	
Frame, with water guard, tool rest, pulley and treadle attachment	\$15.00
Pulley	1.50
Treadle	1.50
Will take stone, maximum size	30" x 4"
Weight, without stone	170 lbs.

No. 157	
Frame, with tool rest, truing attachment and pulley	\$17.00
Water Pot	1.00
Will take stone, maximum size	30" x 4"
Weight, without stone	200 lbs.

Prices do not include stones.

THE "SAMSON" MOUNTED GRINDSTONE

Seasoned hardwood frames, strongly braced and bolted. Two bolts in each end pass through the entire frame from side to side. Has interchangeable fixtures and is provided with treadle, crank and water bucket holder.



SAMSON

No.	STONE		Price Complete, Each
	Weight, lbs.	Thickness, inches	
1	100 to 110	13/4 to 2 1/4	\$7.20
2	70 to 80	13/4 to 2 1/4	6.00
3	40 to 50	13/4 to 2 1/4	5.40



Bi-Treadle

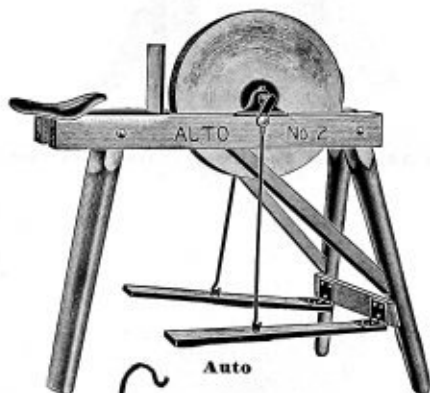
BI-TREADLE MOUNTED GRINDSTONE

Mounted with Specially Selected Stone

"Bi-Treadle." Steel frame, strongly riveted and braced to insure absolute rigidity. All parts coated with black water-proof paint. The maximum size stone which this frame will take is 22x2¾ inches. Can be fitted with regular or ball bearings—both interchangeable.

Style Bearings	Weight	Price Each
Regular ("U" shape)...	80	\$5.50
Ball.....	80	6.00

Shipped knocked down unless otherwise ordered. If desired set up it should be so specified.



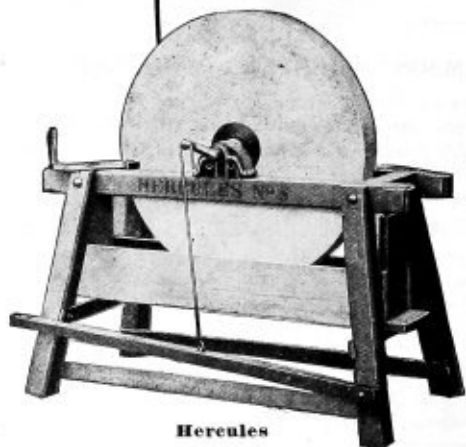
Auto

THE AUTO DOUBLE TREADLE MOUNTED GRINDSTONE

"Auto." Hardwood frame, extra heavy, embracing the bicycle features of the "Bi-Treadle." Fitted with detachable ball bearings, interchangeable fixtures throughout and mounted with genuine Berea or Huron stones.

No.	STONE		Price Each Complete
	Weight, pounds	Thickness, inches	
1	100 to 110	1¾ to 2¼	\$6.00
2	70 to 80	1¾ to 2¼	5.50
3	40 to 50	1¾ to 2¼	5.00

Shipped knocked down unless otherwise ordered. If desired set up it should be so specified.



Hercules

HERCULES MOUNTED GRINDSTONE

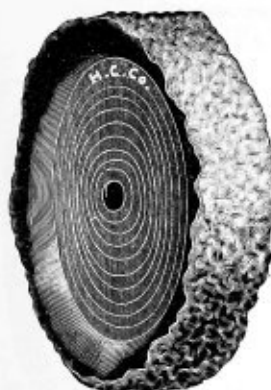
"Hercules." Seasoned oak frame, oil and varnish finish, strongly braced in all directions. Especially designed for railroads and all users who require an extra strong heavy article. Mounted with specially selected stone and furnished with crank, water trough and clothes protector.

Size, No.	Diameter, ins.	Thickness, inches	Stone weighs about, lbs.	Price Complete, Each
1	24	2	80	\$ 6.50
*2	24	3	120	7.50
*4	26	3	140	7.75
5	28	3	165	8.25
7	30	3	185	9.00
10	34	3	240	10.50

*Nos. 2 and 4 are the popular sizes.

Shipped knocked down unless otherwise specified.

CLOTH WHEELS



Made of disks of muslin cloth, stitched spirally and cemented to within one to three inches of periphery.

The surface of the wheel being extremely soft and yielding, permits the face of the wheel to assume any shape desired, and conforms to varying surfaces to be polished.

Extensively used by manufacturers of plows, shovels and farm implements for producing finishing polish.

PRICE EACH

Diam. in inches	THICKNESS IN INCHES						
	1	1½	2	2½	3	3½	4
8	\$1.00	\$1.50	\$2.00	\$2.40	\$2.80	\$3.20	\$3.50
10	1.10	1.60	2.10	2.50	3.10	3.60	4.00
12	1.50	2.25	3.00	3.60	4.50	5.00	5.50
14	2.00	3.00	3.90	4.80	5.70	6.50	7.25
15	2.30	3.40	4.50	5.60	6.60	7.50	8.40
16	2.75	4.10	5.40	6.70	8.00	9.25	10.25
18	3.75	5.60	7.40	9.20	11.00	12.50	14.00
20	5.00	7.50	10.00	12.50	14.50	16.50	18.50

PATENTED PAPER POLISHING WHEELS

Made in Two Styles

The **Straw Board Paper Wheel**—a hard wheel for rough work such as polishing plows, farming tools and all sheet metals.

The **Felt Paper Wheel**—a soft wheel with slightly yielding surface, adapted for finishing work, such as grates, mantels, stove trimmings and all flat metal surfaces.

The iron center bushing is securely held in place, and the wheels are easily kept in balance. They may be run at highest rate of speed with absolute safety.

LIST PRICE EACH, FOR WHEELS WITH IRON BUSHINGS BUT NOT COVERED WITH LEATHER

Diam. in inches.	THICKNESS IN INCHES.						
	1	1½	1¾	1½	2	2½	2¾
4	\$.50	\$.60	\$.70	\$.80	\$.90	\$1.00	\$1.10
6	.75	.85	.95	1.05	1.15	1.25	1.35
8	1.00	1.15	1.30	1.45	1.60	1.80	2.00
10	1.25	1.50	1.75	2.00	2.25	2.50	2.75
12	1.50	1.80	2.20	2.40	2.70	3.00	3.25
14	1.75	2.05	2.35	2.65	2.95	3.25	3.50
16	2.00	2.35	2.70	3.05	3.40	3.70	4.00
18	2.50	2.90	3.30	3.75	4.20	4.60	5.00
20	3.00	3.50	4.00	4.50	5.00	5.50	6.00
22	3.50	4.05	4.60	5.20	5.80	6.40	7.00
24	4.00	5.00	6.00	7.00	8.00	8.50	9.00

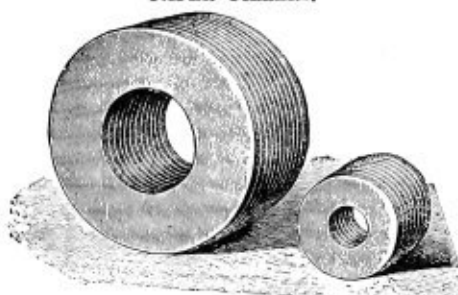
Diam. in inches.	THICKNESS IN INCHES.					
	2½	3	3½	3¾	3½	4
4	\$1.20	\$1.30	\$1.40	\$1.50	\$1.60	\$1.75
6	1.45	1.55	1.65	1.75	1.90	2.00
8	2.15	2.30	2.45	2.60	2.80	3.00
10	3.00	3.20	3.40	3.60	3.80	4.00
12	3.50	3.75	4.00	4.25	4.50	4.75
14	3.80	4.10	4.40	4.70	5.00	5.25
16	4.35	4.70	5.00	5.35	5.70	6.00
18	5.40	5.85	6.25	6.65	7.00	7.50
20	6.50	7.00	7.50	8.00	8.50	9.00
22	7.60	8.20	8.75	9.35	9.95	10.50
24	9.50	10.00	10.50	11.00	11.50	12.00

Sizes under 1 in. thick, same price as 1 in.; under 4 in. diam., same price as 4 in. Intermediate sizes, same price as next size above.

ALL POLISHING WHEELS ARE MADE ONLY TO ORDER

PAPER FRICTION PULLEYS.

PAPER FILLERS.

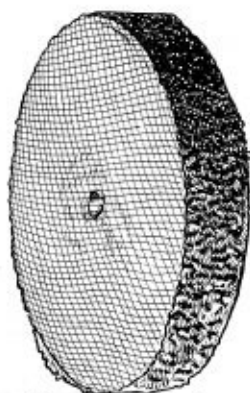


Made from Special Trunk Board Stock, any size or shape, cemented and pressed. Of great efficiency and durability.

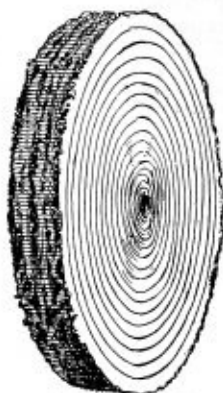
Diam.	Face.	Pressed Friction Roll or Filler.	Friction Wheel Complete with Flanges.	Diam.	Face.	Pressed Friction Roll or Filler.	Friction Wheel Complete with Flanges.
6	6	\$ 2.14	\$ 4.30	13	4	\$ 5.10	\$ 9.48
	8	2.80	5.32		6	7.32	12.34
7	4	1.80	4.00	14	8	9.54	15.18
	5	2.22	4.62		9	10.64	16.68
	6	2.64	5.28		10	11.76	18.12
	8	3.48	6.58		12	13.98	20.98
8	4	2.14	4.58	15	4	5.84	10.62
	5	2.64	5.28		6	8.42	13.82
	6	3.16	6.04		8	11.00	17.04
	8	4.18	7.52		9	12.30	18.72
9	4	2.70	5.40	16	10	13.58	20.34
	5	3.30	6.22		12	16.16	23.54
	6	3.90	7.06	17	4	6.48	11.68
	8	5.10	8.70		6	9.36	15.18
10	9	5.70	9.54		8	12.24	18.70
	4	3.46	6.62		9	13.68	20.52
	6	4.90	8.00	18	10	15.12	22.30
	8	6.34	10.58		12	18.00	25.80
11	9	7.06	11.66		4	7.22	13.12
	10	7.78	12.64		6	10.46	17.06
	12	9.22	14.62	19	8	13.70	21.02
12	4	3.96	7.44		9	15.32	23.12
	6	5.64	9.66		10	16.94	25.10
	8	7.32	11.88		12	20.18	29.06
	9	8.16	13.08	20	4	7.98	14.38
13	10	9.00	14.20		6	11.58	18.70
	12	10.68	16.42		8	15.18	23.02
	4	4.46	8.28		9	16.98	25.30
14	6	6.38	10.72	21	10	18.78	27.46
	8	8.30	13.20		12	22.38	31.78
	9	9.26	14.52	22	4	8.72	15.62
	10	10.22	15.74		6	12.68	20.30
15	12	12.14	18.20		8	16.64	24.98
					9	18.62	27.44
				23	10	20.60	29.78
					12	24.56	34.46

For Friction Rolls, Fillers or Wheels less than 6 inch diameter, use 6 inch list.

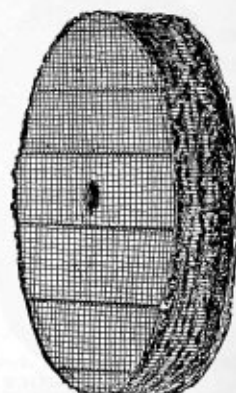
CANVAS POLISHING WHEELS FOR ALL PURPOSES.



No. 50 Solid Wheels



No. 70 Stitched.



No. 80 Special.

Use list below for all wheels on this page.

No. 50 SOLID CANVAS WHEELS.

For polishing plows, stove trimmings, steel tools, and all metals having substantially even or flat surface, where fast cutting wheel is required. Used with No. 20 to No. 60 emery.

Made of best grade of heavy canvas duck, put together with a water-proof cement, making a slightly flexible and resilient surface.

Face of these wheels may be shaped as desired, to conform to any special class of work, such as plow shares, cultivator blades, harrow discs, etc.

No. 60 LOOSE CANVAS WHEELS.

Where extraordinary resiliency or pliability is required, the loose canvas wheel will be found peculiarly adapted.

The wheel is made solid to within one to three inches (or more) from periphery, the result being that after coating with glue and emery, a yielding cushion is formed, easily adapting itself to any shape surface of metal to be polished.

No. 70 STITCHED CANVAS WHEELS.

Made of extra quality of heavy canvas duck, lock-stitched in circles to periphery. Used for same purposes as solid canvas wheels, where wheel with more flexibility on yielding face is required.

No. 80 SPECIAL CANVAS WHEELS.

Particularly recommended for raised stove work, but equally suitable for all polishing where canvas wheel of extra resiliency of face is desired.

Made of extra heavy cotton duck or canvas belting. The combination of this extra heavy material and our pliable cement makes a wheel with yielding surface, yet one which will hold square face.

No. 100 SPECIAL BUFFS.

We furnish buffs cut to size, with or without holes, but not glued, made from extra heavy paper felt canvas; also from old sail canvas, which give the best of satisfaction to plow manufacturers, shovel factories and the like.

Extra heavy new canvas.....per lb., \$0.50
Heavy old canvas..... " .40

Above prices cut to size with hole.

IMPROVED CANVAS WHEELS.
Light Weight and Resilient.

Diam. in inches	THICKNESS IN INCHES						
	1	1½	2	2½	3	3½	4
8	\$1.50	\$2.00	\$2.75	\$3.25	\$3.75	\$4.00	\$4.50
10	1.60	2.20	2.85	3.35	3.85	4.20	4.75
12	2.00	2.75	3.75	4.25	5.25	5.75	6.25
14	2.50	3.50	4.75	5.50	6.50	7.25	8.00
15	3.00	4.10	5.25	6.50	7.25	8.25	9.40
16	3.50	5.00	6.00	7.50	8.75	10.00	11.25
18	4.50	6.40	8.25	10.00	12.00	13.50	15.25
20	5.75	8.50	11.00	13.50	15.50	17.50	19.50

Furnished either hard or soft.

ALL POLISHING WHEELS ARE MADE ONLY TO ORDER

MACHINE CHAIN



No.	American Gauge	Weight, 100 Feet	List, 100 Feet
6-0	9-32	68	\$21.00
5-0	1-4	61	18.00
4-0	7-32	50	15.00
3-0	5	40	14.00
2-0	6	34	13.00
0	7	28	12.50
1	8	23	12.00
2	9	20	11.50
3	10	15	11.00

CABLE CHAINS



Cut of No. 40, Actual Size

No.	For Sash, Lbs.	Steel, per Ft.	Copper, per Ft.
110	400	\$0.17	\$0.23
10	250	.14	.17
30	125	.10	.12
40	75	.09	.11

No.	Steel, per Ft.	No.	Steel, per Ft.
6	\$0.35	50	\$0.22
60	.25	115	.16
55	.20		

No. 75. Brass bell hangers' chain, per foot..\$0.11
Fastening for attaching chain to sash, per window..... .25

SASH CHAIN, STEEL



No.	For Sash, Lbs.	Polished, per 100 Ft.	Copper Plated or Galv., 100 Ft.
0	180	\$6.50	\$7.25
1	130	4.20	4.95
2	80	3.60	4.35

Put up 500 feet on a reel.

PLUMBERS' CHAINS, HARD BRASS



Safety Links

Price per Box of 12 Yards

No.	Brass	Nickel or Silvered	No.	Brass	Nickel or Silvered
000	\$1.15	\$1.25	2	\$2.30	\$2.40
00	1.25	1.35	3	3.15	3.30
0	1.50	1.60	4	3.65	3.80
1	1.85	1.95			

BRIGHT COIL CHAIN



German

Size	Weight per 100 Feet	Price per 100 Feet	Size	Weight per 100 Feet	Price per 100 Feet
5	7	\$6.50	1	19 1/2	\$ 7.80
4	8 1/4	6.60	0	21	8.80
3	10 1/2	6.80	00	29	10.00
2	15	7.20	000	36	11.00



Triumph

Size	Weight per 100 Feet	Price per 100 Feet	Size	Weight per 100 Feet	Price per 100 Feet
4	6 1/2	\$2.75	0	16 1/2	\$4.00
3	8	2.90	00	20 1/2	4.50
2	10	3.10	000	26	5.25
1	12 1/2	3.50			



Brown

Size	Weight per 100 Feet	Price per 100 Feet	Size	Weight per 100 Feet	Price per 100 Feet
4	5	\$2.75	0	12	\$4.00
3	6 1/2	2.90	00	16 1/2	4.50
2	8	3.10	000	19 1/2	5.25
1	9 3/4	3.50			



American

Size	Weight per 100 Feet	Price per 100 Feet	Size	Weight per 100 Feet	Price per 100 Feet
4	8	\$2.75	0	12	\$4.00
3	9	2.90	00	16 1/2	4.50
2	9 1/2	3.10	000	17	5.25
1	11	3.50			

JACK CHAINS



Price per Box of 12 Yards

No.	Iron	Brass	No.	Iron	Brass
8	\$0.95	\$5.25	14	\$0.40	\$1.35
9	.90	4.25	15	.35	1.00
10	.80	3.50	16	.30	.86
11	.55	2.55	17	.30	.82
12	.44	2.05	18	.28	.60
13	.42	1.70	19	.27	.54

CHAIN



COMMON OR PROOF COIL CHAIN

This grade is made of first-class iron, and welded by experienced workmen. It is a good, reliable chain for general use.

"BB" COIL CHAIN

Tested and Certificate Furnished

This chain is made of extra quality material, which will stand a tensile strain of 52,200 pounds to the square inch. It is welded, and dotted to make welds smooth.

"BBB" CHAIN

Tested and Certificate Furnished

This chain is made of extra quality material, especially selected, and will stand a high tensile strain. It is welded with especial care and dollyed, and may be absolutely depended upon where strength and durability are required. We have sold BBB chain largely to stone yards, quarries, and bridge builders. For special heavy lifting, this is a chain which we could recommend.

"DREDGE" CHAIN—BULLOCK BRAND

Tested and Certificate Furnished

This is the best chain made. The iron used is a special dredge quality, refined and re-rolled. It is tough, fibrous, and made hard to prevent wearing rapidly. The iron will stand a tensile strain of 54,500 pounds to the square inch. The welding of the Dredge quality chain is entrusted only to most experienced workmen, and none but those thoroughly competent and reliable are permitted to make this grade of chain. It is carefully inspected both before and after testing.

We recommend our "Dredge" quality chain as the best chain for use on dredges, steam shovels, cranes, wrecking cars, sprocket wheels, for foundry and quarry work, etc.; in fact, for any purpose where hard wearing qualities, strength and durability are a requisite.

We are prepared to galvanize close link coil and cable chain when so desired.

TABLE OF WEIGHTS, PROOFS AND BREAKING STRAIN OF CHAIN

	Size, inches	COMMON OR PROOF				B. B.				B. B. B.				BULLOCK DREDGE						
		Outside, Length in inches	Outside, Width in inches	Weight per 100 feet	Proof Test	Approximate Breaking Strain	Outside, Length in inches	Outside, Width in inches	Weight per 100 feet	Proof Test	Approximate Breaking Strain	Outside, Length in inches	Outside, Width in inches	Weight per 100 feet	Proof Test	Approximate Breaking Strain				
3/4	13 1/2	1 1/2	46	1,000	2,000	1 1/2	1 1/2	50	1,100	2,200	1 1/2	1 1/2	52	1,200	2,400	1 1/2	1 1/2	54	1,300	2,500
1	14 1/2	1 3/4	75	1,500	3,300	1 3/4	1 3/4	80	1,650	3,800	1 3/4	1 3/4	83	1,750	3,900	1 3/4	1 3/4	86	1,850	4,000
1 1/4	15 1/2	1 7/8	110	2,000	5,200	1 7/8	1 7/8	115	2,200	5,600	1 7/8	1 7/8	118	2,300	5,700	1 7/8	1 7/8	121	2,400	5,800
1 1/2	16 1/2	2	155	2,500	7,200	2	2	160	2,800	8,000	2	2	166	3,000	9,000	2	2	171	3,200	9,500
1 3/4	17 1/2	2 1/8	200	3,000	10,000	2 1/8	2 1/8	210	3,500	11,500	2 1/8	2 1/8	215	3,600	12,500	2 1/8	2 1/8	220	3,700	13,000
2	18 1/2	2 1/4	260	3,500	13,000	2 1/4	2 1/4	265	3,800	15,000	2 1/4	2 1/4	268	4,000	16,000	2 1/4	2 1/4	271	4,200	16,500
2 1/4	19 1/2	2 3/8	325	4,000	16,000	2 3/8	2 3/8	335	4,300	18,500	2 3/8	2 3/8	340	4,400	19,000	2 3/8	2 3/8	345	4,500	19,500
2 1/2	20 1/2	2 3/4	400	4,500	20,000	2 3/4	2 3/4	410	4,750	22,000	2 3/4	2 3/4	420	4,900	23,000	2 3/4	2 3/4	425	5,000	23,500
2 3/4	21 1/2	2 7/8	500	5,000	25,000	2 7/8	2 7/8	500	5,500	27,000	2 7/8	2 7/8	510	5,700	28,000	2 7/8	2 7/8	515	5,800	28,500
3	22 1/2	3	800	5,500	30,000	3	3	820	6,000	34,000	3	3	830	6,200	35,000	3	3	835	6,300	35,500
3 1/4	23 1/2	3 1/8	1,000	6,000	35,000	3 1/8	3 1/8	1,020	6,500	39,000	3 1/8	3 1/8	1,040	6,700	40,000	3 1/8	3 1/8	1,045	6,800	40,500
3 1/2	24 1/2	3 1/4	1,300	6,500	40,000	3 1/4	3 1/4	1,350	7,000	44,000	3 1/4	3 1/4	1,370	7,200	45,000	3 1/4	3 1/4	1,375	7,300	45,500
3 3/4	25 1/2	3 3/8	1,500	7,000	45,000	3 3/8	3 3/8	1,550	7,500	49,000	3 3/8	3 3/8	1,575	7,700	50,000	3 3/8	3 3/8	1,580	7,800	50,500
4	26 1/2	3 1/2	1,900	7,500	50,000	3 1/2	3 1/2	1,950	8,000	54,000	3 1/2	3 1/2	2,000	8,300	56,000	3 1/2	3 1/2	2,020	8,500	57,000
4 1/4	27 1/2	3 5/8	2,100	8,000	55,000	3 5/8	3 5/8	2,200	8,500	59,000	3 5/8	3 5/8	2,250	8,800	61,000	3 5/8	3 5/8	2,270	9,000	62,000
4 1/2	28 1/2	3 3/4	2,470	8,500	60,000	3 3/4	3 3/4	2,500	9,000	64,000	3 3/4	3 3/4	2,550	9,300	66,000	3 3/4	3 3/4	2,570	9,500	67,000
4 3/4	29 1/2	3 7/8	2,800	9,000	65,000	3 7/8	3 7/8	2,900	9,500	69,000	3 7/8	3 7/8	2,950	9,800	71,000	3 7/8	3 7/8	2,970	10,000	72,000
5	30 1/2	4	3,100	9,500	70,000	4	4	3,200	10,000	74,000	4	4	3,300	10,300	76,000	4	4	3,350	10,500	77,000
5 1/4	31 1/2	4 1/8	3,500	10,000	75,000	4 1/8	4 1/8	3,600	10,500	79,000	4 1/8	4 1/8	3,700	10,800	81,000	4 1/8	4 1/8	3,750	11,000	82,000
5 1/2	32 1/2	4 1/4	4,000	10,500	80,000	4 1/4	4 1/4	4,100	11,000	84,000	4 1/4	4 1/4	4,200	11,300	86,000	4 1/4	4 1/4	4,250	11,500	87,000

A Safe Working Load is from 20 to 30 per cent. of the Approximate Breaking Strain

STRAIGHT LINK COIL CHAIN



For capacities see table giving proof tests on previous page.

TWIST COIL CHAIN



Twist Coil Chain made in all sizes up to and including $\frac{5}{8}$ -inch.

STUD LINK CABLE CHAIN

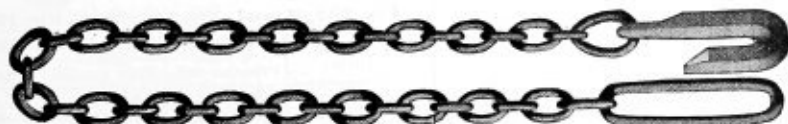


Size Chain, inches	Size Links, inches	Average Weight per Fathom, Lbs.	Proof Test, Tons
$\frac{3}{4}$	$4\frac{1}{2} \times 2\frac{3}{4}$	33	$10\frac{1}{2}$
$\frac{7}{8}$	$4\frac{3}{4} \times 3$	38	12
$\frac{1}{2}$	$5 \times 3\frac{1}{2}$	49	13 $\frac{1}{2}$
$\frac{1}{4}$	$5\frac{1}{2} \times 3\frac{1}{2}$	55	15 $\frac{1}{2}$
1	$5\frac{3}{4} \times 3\frac{3}{4}$	61	18
$1\frac{1}{16}$	$6\frac{1}{2} \times 3\frac{3}{4}$	69	$20\frac{3}{16}$
$1\frac{1}{8}$	$6\frac{1}{2} \times 4\frac{1}{8}$	74	$22\frac{1}{2}$
$1\frac{1}{16}$	$6\frac{3}{4} \times 4\frac{1}{4}$	81	$25\frac{1}{2}$
$1\frac{1}{4}$	$7\frac{1}{8} \times 4\frac{1}{2}$	90	$28\frac{1}{2}$
$1\frac{5}{16}$	$7\frac{3}{8} \times 4\frac{5}{8}$	97	31
$1\frac{3}{8}$	$7\frac{3}{4} \times 4\frac{7}{8}$	110	34
$1\frac{7}{16}$	$8\frac{1}{8} \times 5\frac{1}{8}$	113	$37\frac{1}{2}$
$1\frac{1}{2}$	$8\frac{1}{2} \times 5\frac{3}{8}$	127	$40\frac{1}{2}$
$1\frac{5}{8}$	$8\frac{3}{4} \times 5\frac{5}{8}$	143	44
$1\frac{3}{4}$	$9\frac{1}{4} \times 5\frac{3}{4}$	150	$47\frac{1}{2}$
$1\frac{11}{16}$	$9\frac{5}{8} \times 6$	157	$51\frac{1}{2}$
$1\frac{3}{4}$	$10 \times 6\frac{1}{4}$	173	$55\frac{1}{16}$
$1\frac{7}{8}$	$10\frac{1}{2} \times 6\frac{3}{4}$	203	$63\frac{3}{16}$
$1\frac{1}{2}$	$10\frac{3}{4} \times 7$	215	$67\frac{1}{2}$
2	$11\frac{1}{8} \times 7\frac{1}{4}$	233	72
$2\frac{1}{16}$	$11\frac{1}{2} \times 7\frac{1}{2}$	254	$76\frac{3}{16}$
$2\frac{1}{8}$	$12 \times 7\frac{3}{4}$	276	$81\frac{1}{4}$
$2\frac{1}{4}$	$12\frac{1}{2} \times 8$	290	$86\frac{3}{8}$
$2\frac{3}{4}$	$13 \times 8\frac{1}{4}$	300	91

Above are the U. S. standard dimensions, and are the same as adopted by the leading manufacturers of ship windlasses. Stud Link and Twist Coil Chain not carried in stock but furnished promptly from mill.

Prices upon application.

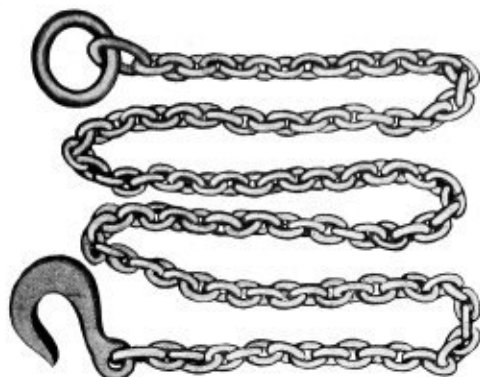
RAILROAD SWITCH OR WRECKING CHAIN



Cut of Style "A" with Grab Hook on One End, Long Link on the Other

Above Furnished Any Diameter, Length or Style to Railroad Companies' Specifications

SLING CHAINS



Made of common "B. B.," "B. B. B.," or "Bullock" dredge chain.

We are in position to furnish from stock, chains of any capacity, and attach hooks or rings at our own shops in the shortest possible time.

Please state length, quality and size of chain desired and style of hooks or rings wanted.

For capacity see table giving "proof tests."

COIL LOG OR BINDING CHAINS



No. 120

Regularly made with one slip hook, one grab hook and swivel in stock lengths of 12, 14 and 16 feet. Made in sizes $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ -inch.

Prices upon application.

We are also prepared to quote on derrick, boom and tow chains, rafting chains, wagon and trace chains, etc.

DROP FORGED CONNECTING LINKS

The "Missing Link"



Size, Inches	Price, Dozen	Size, Inches	Price, Dozen
$\frac{1}{4}$	\$1.00	$\frac{5}{8}$	\$2.00
$\frac{1}{2}$	1.10	$\frac{3}{4}$	2.65
$\frac{3}{8}$	1.20	$\frac{1}{2}$	3.35
$\frac{1}{2}$	1.25	$\frac{7}{8}$	5.00
$\frac{3}{4}$	1.50	1	7.00
$\frac{1}{2}$	1.80		



KEYSTONE QUICK REPAIR LINKS

Forged from Bar Steel

Size, Inches	Price, Dozen	Size, Inches	Price, Dozen
$\frac{1}{4}$	\$2.00	$\frac{1}{2}$	\$ 4.00
$\frac{1}{2}$	2.25	$\frac{3}{8}$	7.50
$\frac{3}{8}$	2.50	$\frac{1}{2}$	10.00
$\frac{1}{2}$	3.25	1	15.00

LAP LINK, SIDE OPEN



Fig. 210

Size, Inches	Price, Gross	Size, Inches	Price, Gross
$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{3}{8}$ x $2\frac{1}{2}$	.....
$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{3}{8}$ x 3	.....
$\frac{1}{2}$ x $2\frac{1}{2}$		



RING DOGS

Flat Pattern. Style "C"

Size Ring	Size Dog	Estimated Wt. per 100	Price per Lb.
3x $\frac{3}{8}$ in.	1 $\frac{1}{4}$ x $\frac{3}{8}$ in.	100 lbs.	Market
3x $\frac{3}{8}$ "	1 $\frac{1}{2}$ x $\frac{3}{8}$ "	115 "	"
3x $\frac{1}{2}$ "	1 $\frac{1}{2}$ x $\frac{3}{8}$ "	131 "	"
3x $\frac{1}{2}$ "	1 $\frac{1}{2}$ x $\frac{1}{2}$ "	185 "	"

Square Pattern. Style "D"

Size Ring	Size Dog	Estimated Wt. per 100	Price per Lb.
$\frac{1}{2}$ in.	$\frac{1}{4}$ sq. x 6 in.	125 lbs.	Market
$\frac{3}{8}$ "	$\frac{3}{8}$ sq. x 6 "	160 "	"
$\frac{1}{2}$ "	1 sq. x 6 "	210 "	"

CHAIN AND ANCHOR SHACKLES

Wrought Iron—Black



★Round Pin Anchor Shackle



★Screw Chain Shackle

Size, Inches	Price Dozen	INSIDE LENGTH		Width Between Eyes	Maximum Strength Lbs.
		Chain	Anchor		
$\frac{3}{8}$	\$3.00	1 $\frac{7}{8}$	1 $\frac{3}{8}$	$\frac{5}{8}$	9,480
$\frac{1}{2}$	4.00	1 $\frac{5}{8}$	1 $\frac{7}{8}$	$\frac{11}{8}$	11,400
$\frac{5}{8}$	5.00	2	2 $\frac{1}{4}$	1	33,400
$\frac{3}{4}$	5.50	2 $\frac{1}{8}$	3	1 $\frac{1}{2}$	43,400
$\frac{7}{8}$	7.25	2 $\frac{3}{8}$	3 $\frac{1}{2}$	1 $\frac{3}{8}$	55,200
1	10.00	3 $\frac{1}{4}$	4	1 $\frac{3}{4}$	74,900
1 $\frac{1}{8}$	16.00	3 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{7}{8}$	90,200
1 $\frac{1}{4}$	20.00	4	5	2	92,040

★Anchor and Chain Shackles Furnished with either Screw or Round Pin.

CHAIN RAFTING DOGS

Regular Pattern, 5 Link Dog, Having 3 Short Center Links and 2 Longer End Links



SIZE OF CHAIN	Size Dog	Estimated Weight per 100	Price per Lb.
$\frac{1}{8}$ x 3 Link, 1 Center Link	$\frac{1}{8}$ x $\frac{3}{8}$	195	M'rk't
$\frac{1}{8}$ x 5 " 3 " "	$\frac{1}{8}$ x $\frac{3}{8}$	215	"
$\frac{1}{8}$ x 7 " 5 " "	$\frac{1}{8}$ x $\frac{3}{8}$	235	"
$\frac{1}{8}$ x 5 " 3 " "	$\frac{1}{4}$ x $\frac{3}{8}$	267	"
$\frac{3}{8}$ x 7 " 5 " "	$\frac{1}{4}$ x $\frac{3}{8}$	298	"
$\frac{1}{2}$ x 14 " 12 " "	$\frac{1}{2}$ x $\frac{1}{2}$	475	"

When 1x $\frac{3}{8}$ inch dogs are ordered add $\frac{1}{2}$ lb. per lb.

STEEL CHAIN HOOKS



Fig. 132, Round Fig. 133, Grab Fig. 134, Bunk

For Chain, Inches	Figure 132, Round, Price per 100	Figure 133, Grab, Price per 100	Figure 134, Bunk, Price per Dozen
$\frac{1}{4}$	\$18.00	\$18.00	.....
$\frac{3}{8}$	18.00	18.00	\$3.40
$\frac{1}{2}$	20.00	20.00	4.05
$\frac{3}{4}$	24.75	24.75	4.95
1	26.00	26.00	5.65
1 $\frac{1}{8}$	38.25	38.25	.....
1 $\frac{1}{4}$	49.50	49.50	.....

WROUGHT IRON OR "BRIDGE" TURNBUCKLES



Standard Lengths

Diameter of Thread, inches	Opening Between Heads, inches	Total Length, inches	Price Each	Diameter of Thread, inches	Opening Between Heads, inches	Total Length, inches	Price Each
$\frac{3}{8}$	$5\frac{1}{2}$	22	\$0.40	$1\frac{1}{8}$	$5\frac{1}{2}$	28	\$1.75
$\frac{7}{16}$	$5\frac{1}{2}$	22	.42	$1\frac{1}{4}$	$5\frac{1}{2}$	28	2.00
$\frac{1}{2}$	$5\frac{1}{2}$	22	.45	$1\frac{3}{8}$	$5\frac{1}{2}$	29	2.25
$\frac{9}{16}$	$5\frac{1}{2}$	22	.48	2	$5\frac{1}{2}$	29	2.65
$\frac{5}{8}$	$5\frac{1}{2}$	22	.50	$2\frac{1}{8}$	$5\frac{1}{2}$	29	3.10
$\frac{3}{4}$	$5\frac{1}{2}$	23	.63	$2\frac{1}{4}$	$5\frac{1}{2}$	30	3.50
$\frac{7}{8}$	$5\frac{1}{2}$	24	.75	$2\frac{3}{8}$	$5\frac{1}{2}$	31	4.00
1	$5\frac{1}{2}$	25	.88	$2\frac{1}{2}$	$5\frac{1}{2}$	32	4.50
$1\frac{1}{8}$	$5\frac{1}{2}$	25	1.00	$2\frac{5}{8}$	$5\frac{1}{2}$	32	5.00
$1\frac{1}{4}$	$5\frac{1}{2}$	26	1.25	$2\frac{3}{4}$	$5\frac{1}{2}$	33	5.50
$1\frac{3}{8}$	$5\frac{1}{2}$	27	1.38	$2\frac{7}{8}$	$5\frac{1}{2}$	33	6.00
$1\frac{1}{2}$	$5\frac{1}{2}$	27	1.50	3	$5\frac{1}{2}$	34	6.50

Extra Lengths

Lengths	Opening Between Heads, inches	Advance on Total Length of Standard Length, inches	Advance on Standard List, per cent
Second.....	9	$3\frac{1}{2}$	25
Third.....	12	$6\frac{1}{2}$	50
Fourth.....	15	$9\frac{1}{2}$	100
Fifth.....	18	$12\frac{1}{2}$	150
Sixth.....	24	$18\frac{1}{2}$	350

GALVANIZED SLEEVE TURNBUCKLES



Size, inches	Price Each	Size, inches	Price Each
$\frac{3}{16}$	\$1.25	$\frac{1}{8}$	\$2.25
$\frac{1}{8}$	1.50	$\frac{3}{16}$	2.75
$\frac{1}{16}$	1.75	$\frac{1}{4}$	4.00
$\frac{1}{2}$	2.00		

GALVANIZED WROUGHT IRON PIPE TURNBUCKLES



With shackle and eye, hook and eye, two eyes, two shackles, or stub ends. Right and left hand threads.

Diameter Screw, inch	Length of Pipe, inches	Price Each	Diameter Screw, inch	Length of Pipe, inches	Price Each
$\frac{1}{4}$	$5\frac{1}{2}$	\$1.00	$\frac{1}{2}$	$8\frac{1}{4}$	\$1.80
$\frac{3}{8}$	$5\frac{3}{4}$	1.10	$\frac{5}{8}$	$10\frac{1}{2}$	2.40
$\frac{1}{2}$	$6\frac{1}{4}$	1.30	$\frac{3}{4}$	13	3.50
$\frac{3}{4}$	7	1.50			

WROUGHT IRON TURNBUCKLES

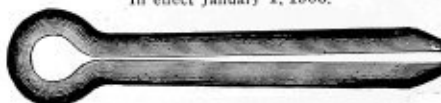


Furnished with Hook and Eye, Two Eyes or Two Hooks

Diameter Screw, inches	Length Between Heads, inches	PRICE EACH	
		Black	Galvanized
$\frac{3}{16}$	$3\frac{1}{2}$	\$ 0.70	\$ 0.70
$\frac{1}{4}$	4	.85	.75
$\frac{5}{16}$	$4\frac{1}{4}$	.80	.90
$\frac{3}{8}$	$4\frac{1}{2}$	.90	1.10
$\frac{7}{16}$	5	1.00	1.25
$\frac{1}{2}$	6	1.30	1.50
$\frac{5}{8}$	7	1.70	1.85
$\frac{3}{4}$	8	1.80	2.20
$\frac{7}{8}$	9	2.50	3.25
1	10	4.25	5.00
$1\frac{1}{8}$	11	4.75	5.50
$1\frac{1}{4}$	12	5.25	7.00
$1\frac{3}{8}$	13	6.25	8.25
$1\frac{1}{2}$	14	7.50	9.50
$1\frac{3}{4}$	15	9.00	11.00
2	16	13.00	15.00
	16	17.00	20.00
	16	25.00	28.00

SPRING COTTERS

In effect January 1, 1906.



All Measurements are Made Under the Eye

PRICE PER THOUSAND

WIRE GAUGE NUMBER

Wire Gauge Diameter	13	12	11	10	9	8	7	6	5	4	1			
Length, in.	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$
$\frac{1}{32}$	3.50	4.00	5.00	6.00	7.00	8.00	9.00	11.10	12.00					
$\frac{1}{16}$	4.15	4.75	5.85	7.00	8.15	9.30								
1	4.80	5.50	6.70	8.00	9.30	10.60	12.80	14.00	18.00	20.00	32.50			
$1\frac{1}{2}$	5.45	6.25	7.55	9.00	10.45	11.90	14.50	16.00	20.80	23.50	37.50			
$1\frac{1}{4}$	6.10	7.00	8.40	10.00	11.60	13.20	16.20	18.00	23.60	27.00	42.50	72.00		
$1\frac{1}{2}$	6.75	7.75	9.25	11.00	12.75	14.50	17.90	20.00	26.40	30.50	47.50	79.20	108.00	
2	7.40	8.50	10.10	12.00	13.90	15.80	19.60	22.00	29.20	34.00	52.50	86.40	119.50	148.50
$2\frac{1}{4}$			10.95	13.00	15.05	17.10	21.30	24.00	32.00	37.50	57.50	93.60	131.00	163.50
$2\frac{1}{2}$			11.80	14.00	16.20	18.40	23.00	26.00	34.80	41.00	62.50	100.80	142.50	178.50
$2\frac{3}{4}$							24.70	28.00	37.60	44.50	67.50	108.00	154.00	193.50
3							26.40	30.00	40.40	48.00	72.50	115.20	165.50	208.50
$3\frac{1}{4}$										51.50	77.50	122.40	177.00	223.50
$3\frac{1}{2}$										55.00	82.50	129.60	188.50	238.50
$3\frac{3}{4}$										58.50	87.50	136.80	200.00	253.50
4										62.00	92.50	144.00	211.50	268.50
5												257.50	328.50	544.00
6													388.50	644.00

Box containing 100 assorted Cotters suitable for agricultural implements Price \$2.00

CELLAR BOX COTTERS

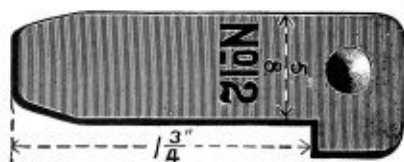
In effect January 1, 1906.



PRICE PER THOUSAND

Length inches	DIAMETER, INCHES					
	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
3						900.00
4						1068.00
5						1236.00
6						1404.00
7	412.00	628.00	796.00	832.00	960.00	1572.00
8	454.00	689.00	877.00	948.00	1080.00	1740.00
9	496.00	750.00	958.00	1044.00	1200.00	1908.00
10	538.00	811.00	1039.00	1140.00	1320.00	2076.00
11	580.00	872.00	1120.00	1236.00	1440.00	2244.00
12	622.00	933.00	1201.00	1332.00	1560.00	2412.00
13	664.00	994.00	1282.00	1428.00	1680.00	2580.00
14	706.00	1055.00	1363.00	1524.00	1800.00	2748.00
15	748.00	1116.00	1444.00	1620.00	1920.00	2916.00
16	790.00	1177.00	1525.00	1716.00	2040.00	3084.00
17	832.00	1238.00	1606.00	1812.00	2160.00	3252.00
18	876.00	1299.00	1687.00	1908.00	2280.00	3420.00

RIVETED KEYS



Over forty different sizes and patterns. Prices upon application.

FLAT SPRING KEYS

In effect January 1, 1906.



PRICE PER THOUSAND

Length, inches	WIDTH IN INCHES			
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$
$1\frac{1}{4}$	39.00	52.00		
$1\frac{1}{2}$	44.50	58.00		
$1\frac{3}{4}$	50.00	64.00	78.00	
2	55.50	70.00	84.50	104.00
$2\frac{1}{4}$	61.00	76.00	91.00	111.00
$2\frac{1}{2}$	66.50	82.00	97.50	118.00
$2\frac{3}{4}$	72.00	88.00	104.00	125.00
3	77.50	94.00	110.50	132.00
$3\frac{1}{4}$			117.00	139.00
$3\frac{1}{2}$			123.50	146.00

NUBBED END SPRING KEYS



LIST PRICE PER THOUSAND

No. 000	Wire Gauge	12	Price
00			\$5.00
0		12	5.50
1		12	6.00
1		11	6.50
$1\frac{1}{2}$		11	6.80
2		10	7.00
3		10	7.50
4		10	8.00

ASSORTED



SPRING COTTERS

For the convenience of our customers, we pack Spring Cotter in special assortments as shown below.

Ass't No.	Contains	Price	Ass't No.	Contains	Price
1	100 Cotter —10 each of the following: $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$	\$4.00	3	25 Cotter —3 each of the following: $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ And 2 each: $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$	\$1.50
2	50 Cotter —5 each of the following: $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$	\$2.25	4	100 Cotter : 15 each, $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ 5 each, $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$ 20 each, $\frac{1}{8} \times \frac{1}{4}$ — $\frac{1}{8} \times \frac{1}{2}$	\$2.00

GIB HEAD SQUARE MACHINE KEYS—Finished



LIST PRICE PER 100. Dimensions Immediately Under Head in Inches.

Length Under Head in Inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1	Length Under Head in Inches
1	\$ 9.10	\$ 9.25	\$ 9.50	\$10.00	\$11.00	\$12.50	\$14.50	\$17.00	\$20.00	\$23.50	\$28.00	\$33.00	\$38.00	1
1 1/4	9.70	9.90	10.20	10.75	11.90	13.55	15.80	18.60	21.95	25.50	\$30.25	\$35.50	\$41.00	1 1/4
1 1/2	10.30	10.55	10.90	11.50	12.80	14.60	17.10	20.20	23.90	28.20	33.20	\$38.50	\$44.50	1 1/2
1 3/4	10.90	11.20	11.60	12.25	13.70	15.65	18.40	21.80	25.85	30.70	36.05	\$41.55	\$48.55	1 3/4
2	11.50	11.85	12.30	13.00	14.60	16.70	19.70	23.40	27.80	33.10	38.90	\$44.55	\$52.55	2
2 1/4	12.10	12.50	13.00	13.75	15.50	17.75	21.00	25.00	29.75	35.50	41.75	\$48.55	\$56.55	2 1/4
2 1/2	12.70	13.15	13.70	14.50	16.40	18.80	22.30	26.60	31.70	37.90	44.60	\$50.55	\$59.00	2 1/2
2 3/4	13.30	13.80	14.40	15.25	17.30	19.85	23.60	28.20	33.65	40.30	47.45	\$52.55	\$61.50	2 3/4
3	13.90	14.45	15.10	16.00	18.20	20.90	24.90	29.80	35.60	42.70	50.30	\$54.55	\$64.00	3
3 1/4	14.50	15.10	15.80	16.75	19.10	21.95	26.20	31.40	37.55	45.10	53.15	\$56.55	\$66.50	3 1/4
3 1/2	15.10	15.75	16.50	17.50	20.00	23.00	27.50	33.00	39.50	47.50	56.00	\$58.55	\$69.00	3 1/2
3 3/4	15.70	16.40	17.20	18.25	20.90	24.05	28.80	34.60	41.45	49.90	58.85	\$60.55	\$71.50	3 3/4
4	16.30	17.05	17.90	19.00	21.80	25.10	30.10	36.20	43.40	52.30	61.70	\$62.55	\$74.00	4
4 1/4	16.90	17.70	18.60	19.75	22.70	26.15	31.40	37.80	45.35	54.70	64.55	\$64.55	\$76.50	4 1/4
4 1/2	17.50	18.35	19.30	20.50	23.60	27.20	32.70	39.40	47.30	57.10	67.40	\$66.55	\$79.00	4 1/2
4 3/4	18.10	19.00	19.95	21.25	24.50	28.25	34.00	41.00	49.25	59.50	70.25	\$68.55	\$81.00	4 3/4
5	18.70	19.65	20.60	22.00	25.40	29.30	35.30	42.60	51.20	61.90	73.10	\$70.55	\$83.00	5
5 1/4	19.30	20.25	21.20	22.60	26.30	30.25	36.60	44.20	53.15	64.30	75.95	\$72.55	\$85.00	5 1/4
5 1/2	19.90	20.90	21.90	23.40	27.20	31.20	37.90	45.80	55.10	66.70	78.80	\$74.55	\$87.00	5 1/2
5 3/4	20.50	21.50	22.50	24.25	28.10	32.20	39.20	47.40	56.65	68.60	81.50	\$76.55	\$89.00	5 3/4
6	21.10	22.15	23.20	25.10	29.00	33.20	40.50	49.00	58.50	71.50	84.50	\$78.55	\$91.00	6
6 1/4	21.70	22.75	23.80	25.90	29.90	34.20	41.80	50.60	60.35	73.90	87.50	\$80.55	\$93.00	6 1/4
6 1/2	22.30	23.35	24.40	26.75	30.80	35.20	43.10	52.20	62.15	76.20	90.20	\$82.55	\$95.00	6 1/2
6 3/4	22.90	23.95	25.00	27.60	31.70	36.20	44.40	53.80	64.05	78.70	93.05	\$84.55	\$97.00	6 3/4
7	23.50	24.55	25.60	28.50	32.60	37.20	45.70	55.50	65.85	80.00	95.00	\$86.55	\$99.00	7
7 1/4	24.10	25.15	26.20	29.40	33.50	38.20	47.00	57.20	67.65	82.00	97.00	\$88.55	\$101.00	7 1/4
7 1/2	24.70	25.75	26.80	30.30	34.40	39.20	48.30	58.70	69.15	83.50	99.00	\$90.55	\$103.00	7 1/2
7 3/4	25.30	26.35	27.40	31.20	35.30	40.20	49.60	60.20	70.65	85.00	101.00	\$92.55	\$105.00	7 3/4
8	25.90	26.95	28.00	32.10	36.20	41.20	50.90	61.70	72.15	86.50	103.00	\$94.55	\$107.00	8
8 1/4	26.50	27.55	28.60	33.00	37.10	42.20	52.20	63.20	73.65	88.00	105.00	\$96.55	\$109.00	8 1/4
8 1/2	27.10	28.15	29.20	33.90	38.00	43.20	53.50	64.70	75.15	89.50	107.00	\$98.55	\$111.00	8 1/2
8 3/4	27.70	28.75	29.80	34.80	38.90	44.20	54.80	66.20	76.65	91.00	109.00	\$100.55	\$113.00	8 3/4
9	28.30	29.35	30.40	35.70	39.80	45.20	56.10	67.70	78.15	92.50	111.00	\$102.55	\$115.00	9
9 1/4	28.90	29.95	31.00	36.60	40.70	46.20	57.40	69.20	79.65	94.00	113.00	\$104.55	\$117.00	9 1/4
9 1/2	29.50	30.55	31.60	37.50	41.60	47.20	58.70	70.70	81.15	95.50	115.00	\$106.55	\$119.00	9 1/2
9 3/4	30.10	31.15	32.20	38.40	42.50	48.20	59.90	72.20	82.65	97.00	117.00	\$108.55	\$121.00	9 3/4
10	30.70	31.75	32.80	39.30	43.40	49.20	61.20	73.70	84.15	98.50	119.00	\$110.55	\$123.00	10
10 1/4	31.30	32.35	33.40	40.20	44.30	50.20	62.50	75.20	85.65	100.00	121.00	\$112.55	\$125.00	10 1/4
10 1/2	31.90	32.95	34.00	41.10	45.20	51.20	63.80	76.70	87.15	101.50	123.00	\$114.55	\$127.00	10 1/2
10 3/4	32.50	33.55	34.60	42.00	46.10	52.20	65.10	78.20	88.65	103.00	125.00	\$116.55	\$129.00	10 3/4
11	33.10	34.15	35.20	42.90	47.00	53.20	66.40	79.70	90.15	104.50	127.00	\$118.55	\$131.00	11
11 1/4	33.70	34.75	35.80	43.80	47.90	54.20	67.70	81.20	91.65	106.00	129.00	\$120.55	\$133.00	11 1/4
11 1/2	34.30	35.35	36.40	44.70	48.80	55.20	69.00	82.70	93.15	107.50	131.00	\$122.55	\$135.00	11 1/2
11 3/4	34.90	35.95	37.00	45.60	49.70	56.20	70.30	83.80	94.65	109.00	133.00	\$124.55	\$137.00	11 3/4
12	35.50	36.55	37.60	46.50	50.60	57.20	71.60	84.90	96.15	110.50	135.00	\$126.55	\$139.00	12
12 1/4	36.10	37.15	38.20	47.40	51.50	58.20	72.90	86.00	97.65	112.00	137.00	\$128.55	\$141.00	12 1/4

NOTE—Only sizes shown in black face type carried in stock. Other sizes furnished to order.

STANDARD STEEL TAPER PINS

Taper one-quarter inch to the foot. In giving sizes other than those included in list, measure at largest point.

PRICE PER 100

Diameter at Large End	.156	.172	.192	.219	.250	.289	.341	.409	.492	.591	.706
Approximate Fractional Sizes	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Number	0	1	2	3	4	5	6	7	8	9	10
$\frac{3}{4}$	\$1.80	\$2.00	\$2.10	\$2.20	\$2.50	\$2.75	\$3.00				
1	2.05	2.25	2.35	2.45	2.75	3.00	3.25	\$3.75			
$1\frac{1}{4}$	2.20	2.50	2.60	2.80	3.00	3.25	3.50	4.00	\$ 4.50		
$1\frac{1}{8}$	2.55	2.75	2.85	3.05	3.25	3.50	3.75	4.25	5.00	\$ 7.00	\$ 9.00
$1\frac{1}{2}$	2.80	3.00	3.10	3.30	3.50	3.75	4.00	4.50	5.40	7.50	9.50
2		3.25	3.35	3.55	3.75	4.05	4.35	4.75	5.80	8.00	10.00
$2\frac{1}{4}$			3.60	3.80	4.00	4.40	4.75	5.25	6.35	8.60	10.75
$2\frac{1}{2}$				4.05	4.25	4.75	5.20	5.75	6.75	9.20	11.50
$2\frac{3}{4}$				4.30	4.50	5.10	5.70	6.25	7.25	9.80	12.25
3				4.55	4.75	5.45	6.25	6.75	7.80	10.50	13.25
$3\frac{1}{4}$							6.75	7.25	8.40	11.20	14.25
$3\frac{1}{2}$							7.25	7.75	9.00	11.90	15.25
$3\frac{3}{4}$							7.75	8.25	9.60	12.60	16.25
4							8.25	8.75	10.20	13.30	17.25
$4\frac{1}{4}$									10.80	14.00	18.25
$4\frac{1}{2}$									11.40	14.70	19.25
$4\frac{3}{4}$										15.40	20.25
5										16.10	21.25
$5\frac{1}{4}$											22.25
$5\frac{1}{2}$										16.80	23.25
$5\frac{3}{4}$											23.25
6											24.25
$6\frac{1}{4}$											25.25

PADLOCKS

CAST BRONZE PIN
TUMBLER

No. 04186

Fine polished finish, case hardened, steel shackle, self locking spring shackle, two keys with each lock. No two locks alike. Can be master keyed to an unlimited number of changes without affecting the security of the lock. 2 keys.

No.....	04186
Size, inches.....	2
Weight per doz.....	9 lbs.
Each.....	\$ 1.50
Doz.....	15.00
Master keyed, add doz.....	2.00
Master Keys, extra.....	.35

CAST BRONZE

Self locking, spring shackle, 3 secure levers, two keys. 3000 changes or 2500 changes with master keys.

No.....	04204
Size, inches.....	2
Weight, doz.....	5 lbs.
Price, each.....	\$ 1.50
Price, doz.....	15.00

More than 12 changes 50c doz. net. Master keyed \$1.00 doz. net. Master keys 25c each, extra.



No. 04204

ALL BRASS
Six Secure Levers

Self locking, spring shackle, two keys, can be made with 3000 changes of keys and 2500 changes with master keys.

No.....	04199
Size, inches.....	2
Weight, per doz, lbs.....	4½
Price, each.....	\$ 1.20
Price, per doz.....	12.00
Master keyed, add doz. net.....	1.00
Master keys, extra.....	.35

For making with more than 12 changes add 50c per dozen, net.



No. 04199

BRASS PLATED
STEEL

Self locking, eight secure levers, two keys, can be made with 3120 changes or 780 changes to master key.

No.....	4132½
Size, inches.....	2½
Weight, doz.....	8 lbs.
Price, each.....	\$ 1.00
Price, per doz.....	10.00
Master keyed, per doz. net.....	1.00

No. 4132½C

Same as above except it has heavy iron chain 9 inches long.

Price, each.....	\$ 1.20
Price, doz.....	12.00

For more than 12 changes add \$1.00 doz. net. Master keys 25c each, extra.



No. 4132½

CAST BRONZE PADLOCK

Unfinished

Self locking, spring shackle drop, secure lever and ward, three changes in a dozen, heavy chain 9 inches long.

No.....	04140
Size, inches.....	2½ in.
Price, each.....	\$ 1.30
Price, doz.....	13.00



BRASS AND STEEL SECURE LEVER PADLOCKS

Self locking, cast spring shackle, 6 secure levers, all different in a dozen. Can be made with 447 changes of keys or 149 changes to master keys. For making with more than 12 changes add \$1.00 per dozen net. Master keys, each 25c extra. Made in three styles as follows:

No. 4010—Steel, ivory black case.....Each, \$0.50 Doz. \$ 5.00

No. 04010—Brass, buffed case.....Each, \$0.90 Doz. \$ 9.00

No. 4010C—Steel, ivory black case, heavy iron chain, 9 in. long. Each, \$1.00 Doz. \$10.00

BRASS AND STEEL PADLOCKS WITH CHAINS



One inch, self locking, 3 levers steel, ivory black case, nickel plated shackle and chain. No. 4047C has chain 12 inches long.

No. 4047 (no chain).....Each, \$0.40 Doz. \$4.00

No. 4047C (12 in. chain).....Each, .60 Doz. 6.00

No. 4049 BRASS PADLOCKS
1½ Inch

1½ inch; self locking, 3 secure levers; brass satin finish.
Each.....\$0.60
Dozen.....6.00

STEEL STRAP HINGES



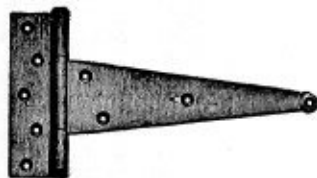
Light

Length, inches.....	3	4	5	6	8	10
No. of Screw.....	6	7	8	9	10	10
Wt. per doz. pairs, lbs.	3	3 1/4	6 1/4	8 3/4	15	21
Price per dozen pairs.....	\$0.85	1.10	1.35	1.70	2.40	3.30

Heavy

Length, inches.....	4	5	6	8	10	12	14
No. of Screw.....	9	9	11	12	13	14	16
Wt. per doz. pairs, lbs.	6 1/4	10	18 1/2	32	54	76	85
Price per doz. pairs.....	\$1.60	2.15	2.80	4.50	6.80	10.40	12.20

STEEL "T" HINGES



Light

Length, inches.....	3	4	5	6	8	10
No. of Screw.....	6	7	8	8	9	10
Wt. per doz. pairs, lbs.	2 1/4	3 1/4	5	6	9 1/4	13
Price per dozen pairs.....	\$0.75	.80	1.00	1.20	1.50	2.20

Heavy

Length, inches.....	4	5	6	8	10	12
No. of Screw.....	8	8	9	10	11	11
Wt. per doz. pairs, lbs.	5	6 1/4	8 1/4	12	18	18
Price per dozen pairs.....	\$0.90	1.05	1.25	1.55	2.30	

Extra Heavy

Length, inches.....	4	5	6	8	10	12
No. of Screw.....	10	11	12	13	16	17
Wt. per doz. pairs, lbs.	8	14	21	35	55	78
Price per dozen pairs.....	\$1.80	2.45	3.00	5.00	7.40	10.70

HINGE HASPS

Wrought Iron



Length, inches.....	3	4 1/4	6	8	10
Wt. per dozen, lbs.	1 1/4	2 1/4	4 1/4	7 1/4	12
Price per single dozen.....	\$0.35	.60	.80	1.05	1.50

WROUGHT STEEL STAPLES



No. 5

Length, inches.....	1 1/4	2	2 1/4	3	3 1/4	4
Price per gross.....	\$1.25	1.70	2.35	3.20	3.70	5.25

WROUGHT HOOKS AND STAPLES



No. 10. Not Japanned

Length, inches.....	4	5	6	7	8
Price per gross.....	\$10.00	12.00	14.00	22.00	25.00

SCREW HOOK AND STRAP



Inches.....	6	8	10	12	14
Size of Hook.....	1 1/2	1 1/2	2 1/2	3 1/2	4 1/2
Wt. per dozen, lbs.	21	24	33	48	70
Per lb.....	\$0.07 1/2	.07 1/2	.07 1/2	.07 1/2	.07 1/2
Inches.....	16	18	20	22	24
Size of Hook.....	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2
Wt. per dozen, lbs.	74	90	96	126	132
Per lb.....	\$0.07	.07	.07	.06 1/2	.06 1/2

WROUGHT HASP AND STAPLES



No. 20. Not Japanned

Length, inches.....	6	8	10	12
Price per dozen.....	\$1.00	1.30	2.00	2.60

BRIGHT WIRE SCREW EYES



Number	Per Gross	Number	Per Gross
0	\$13.00	12	\$1.50
1	11.00	13	1.40
2	8.50	14	1.30
3	7.00	104	5.00
4	5.50	105	4.00
5	4.50	106	3.25
6	3.50	107	2.75
7	3.00	108	2.30
8	2.50	109	2.00
9	2.25	110	1.80
10	2.00	111	1.60
11	1.75	112	1.40

BRIGHT WIRE SCREW HOOKS



Number	Per Gross	Number	Per Gross
0	\$18.00	7	\$4.00
1	15.50	8	3.50
2	13.00	9	2.80
3	11.00	10	2.40
4	8.00	11	2.20
5	6.50	12	2.00
6 1/2	5.00	13	1.90
		14	1.80



IMPERIAL FILES

BEST REFINED
CRUCIBLE STEEL

MANUFACTURED BY

H.Channon Company.
Chicago.

WARRANTED EXTRA QUALITY PERFECT IN TEMPER AND WORKMANSHIP



SQUARE AND HEXAGON HEAD CAP SCREWS

FINISHED HEADS. PRICE PER HUNDRED
Adopted April 1, 1905.



Diameter of Square Head	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1 1/8	1 1/4	1 3/8	1 1/2
Diameter of Hexagon Head	7/16	1/2	9/16	5/8	3/4	13/16	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Diameter of Screw	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Length under Head to Extreme Point.	3/4	\$3.00	\$3.25	\$3.75	\$4.50	\$5.70	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....
	7/8	3.15	3.40	3.90	4.70	5.80	.....	.....	.....	.....	.....	.....
	1	3.25	3.50	4.00	4.90	5.90	9.25	9.25	.....	.....	.....	.....
	1 1/4	3.50	3.75	4.25	5.30	6.50	9.50	9.50	12.50	.....	.....	.....
	1 1/2	3.75	4.00	4.50	5.70	7.10	10.00	10.00	13.50	18.40	.....	.....
	1 3/4	4.00	4.25	4.85	6.10	7.70	10.75	10.75	14.50	19.70	22.75	.....
	2	4.25	4.85	5.20	6.50	8.30	11.50	11.50	15.50	21.00	25.00	34.00
	2 1/4	4.70	5.35	5.55	7.15	8.90	12.60	12.60	16.50	22.40	27.25	36.75
	2 1/2	5.25	5.80	6.00	7.50	9.50	13.60	13.60	17.50	23.70	29.50	39.50
	2 3/4	5.75	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25
	3	6.25	6.80	7.20	8.40	10.70	15.20	15.20	20.60	26.40	34.00	45.00
	3 1/4	.....	.....	.....	9.15	11.50	16.00	16.00	22.10	28.20	36.25	47.75
	3 1/2	.....	.....	.....	9.75	12.30	17.30	17.30	23.70	30.00	38.50	50.50
	3 3/4	.....	.....	.....	10.50	13.10	18.60	18.60	25.30	31.80	40.75	53.25
	4	.....	.....	.....	11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00
	4 1/4	.....	.....	.....	.....	.....	.....	.....	21.20	28.50	35.40	45.25
	4 1/2	.....	.....	.....	.....	.....	.....	.....	22.50	30.10	37.20	47.50
	4 3/4	.....	.....	.....	.....	.....	.....	.....	31.70	39.00	47.50	64.25
	5	.....	.....	.....	.....	.....	.....	.....	40.80	52.00	67.00	80.50
Threads to inch	20	18	16	14	12	12	11	10	9	8	7	7
Add for Each 1/4 inch	.40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	2.25	2.75	3.50

ROUND, FLAT AND FILLISTER HEAD CAP SCREWS



Fillister Head



Round Head



Flat Head

Round and Fillister Head—Finished Heads—Price per Hundred

Dimensions of Head.....	1/4x3/8	1/4x1/2	1/4x5/8	1/2x1/2	1/2x3/4	1/2x1	3/4x3/4	3/4x1	1x1
Diameter of Screw.....	1/4	1/2	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4
3/4	\$2.00	\$2.25	\$2.50	\$3.00	\$3.50	\$4.00	\$ 5.00	\$ 6.00	\$.....
1	2.25	2.50	2.75	3.25	3.75	4.25	5.20	6.20	.....
1 1/4	2.50	2.75	3.00	3.50	4.00	4.50	5.60	6.60	9.00
1 1/2	2.75	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50
1 3/4	3.00	3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00
2	3.25	3.50	3.75	4.25	5.00	5.50	6.75	8.00	10.75
2 1/4	3.50	3.75	4.00	4.75	5.50	6.00	7.25	8.50	11.50
2 1/2	3.75	4.00	4.25	5.15	6.00	6.50	7.75	9.00	12.00
2 3/4	.....	4.25	4.50	5.55	6.50	7.00	8.25	9.50	12.75
3	.....	.....	4.75	5.95	7.00	7.50	8.75	10.00	13.50
3 1/4	.....	.....	.....	6.25	7.50	8.00	9.25	10.50	14.25
3 1/2	.....	.....	.....	.....	8.00	9.00	10.25	11.50	15.00
3 3/4	.....	.....	.....	.....	.....	9.00	10.25	11.50	15.75
4	.....	.....	.....	.....	.....	.....	10.25	12.00	16.50

Flat Head—Finished Heads—Price per Hundred

Diameter of Head.....	1/4	5/16	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4
Threads to inch.....	40	24	20	18	16	14	12	12	12
Diameter of Screw.....	1/4	5/16	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4
3/4	\$2.25	\$2.50	\$3.10	\$4.00	\$5.00	\$.....	\$.....	\$.....	\$.....
1	2.50	2.75	3.35	4.25	5.30	6.60	.....	.....	.....
1 1/4	2.75	3.00	3.60	4.50	5.60	6.90	9.00	.....	.....
1 1/2	3.00	3.25	3.85	4.75	5.90	7.20	9.50	12.00	.....
1 3/4	3.25	3.50	4.10	5.00	6.20	7.50	10.00	12.50	.....
2	.....	3.75	4.35	5.50	6.75	8.00	10.75	13.00	.....
2 1/4	.....	.....	4.75	6.00	7.25	8.50	11.50	13.75	.....
2 1/2	.....	.....	.....	6.50	7.75	9.00	12.00	14.50	.....
2 3/4	.....	.....	.....	7.00	8.25	9.50	12.75	15.25	.....
3	.....	.....	.....	.....	8.75	10.00	13.50	16.00	.....
Add for each 1/4 inch in length	.25	.25	.40	.50	.50	.50	.50	.75	.75

IRON SET SCREWS



PRICE PER HUNDRED

Adopted April 1, 1905.

Diameter of Screw	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
1/2	\$1.80	\$2.00	\$2.35	\$2.80	\$3.30	\$4.00	\$5.00	\$6.50	\$8.50	\$11.00	\$14.00	\$17.50
5/8	1.90	2.10	2.45	2.90	3.40	4.10	5.10	6.60	8.60	11.10	14.10	17.60
3/4	2.00	2.20	2.50	2.90	3.40	4.10	5.10	6.60	8.60	11.10	14.10	17.60
7/8	2.10	2.30	2.60	3.00	3.60	4.30	5.30	6.80	8.80	11.30	14.30	17.80
1	2.15	2.35	2.65	3.10	3.80	4.50	5.50	7.00	9.00	11.50	14.50	18.00
1 1/4	2.30	2.50	2.85	3.50	4.30	5.10	6.10	7.60	9.60	12.10	15.10	18.60
1 1/2	2.50	2.70	3.10	4.00	4.80	5.60	6.60	8.10	10.10	12.60	15.60	19.10
1 3/4	2.75	3.00	3.50	4.50	5.40	6.20	7.20	8.70	10.70	13.20	16.20	19.70
2	3.25	3.50	4.00	5.15	6.00	6.80	7.80	9.30	11.30	13.80	16.80	20.30
2 1/4	3.75	4.00	4.50	5.75	6.75	7.60	8.60	10.10	12.10	14.60	17.60	21.10
2 1/2	4.25	4.50	5.00	6.35	7.50	8.40	9.40	10.90	12.90	15.40	18.40	21.90
2 3/4	4.75	5.00	5.50	6.75	8.25	9.10	10.10	11.60	13.60	16.10	19.10	22.60
3	5.25	5.50	6.00	7.20	9.00	10.00	11.00	12.50	14.50	17.00	20.00	23.50
3 1/4	.....	.....	.....	7.60	9.75	10.75	11.75	13.25	15.25	17.75	20.75	24.25
3 1/2	.....	.....	.....	8.00	10.50	11.50	12.50	14.00	16.00	18.50	21.50	25.00
3 3/4	.....	.....	.....	8.50	11.25	12.25	13.25	14.75	16.75	19.25	22.25	25.75
4	.....	.....	.....	9.00	12.00	13.00	14.00	15.50	17.50	20.00	23.00	26.50
4 1/4	.....	.....	.....	.....	.....	.....	.....	15.90	17.90	20.40	23.40	26.90
4 1/2	.....	.....	.....	.....	.....	.....	.....	16.70	18.70	21.20	24.20	27.70
4 3/4	.....	.....	.....	.....	.....	.....	.....	26.50	28.50	31.00	34.00	37.50
5	.....	.....	.....	.....	.....	.....	.....	.....	37.20	40.20	43.20	46.70
Threads to inch	20	18	16	14	12	12	11	10	9	8	7	7
Add for Each 1/4 inc	.50	.60	.70	.80	.90	1.10	1.10	1.50	1.70	2.25	3.30	4.30

For list price of steel set screws, add 25 per cent to the above.

HOLLOW SET SCREWS

ECONOMICAL because

One length is efficient for any depth of hole, which obviates the carrying of a great variety of lengths, as is necessary with the old styles.

And because

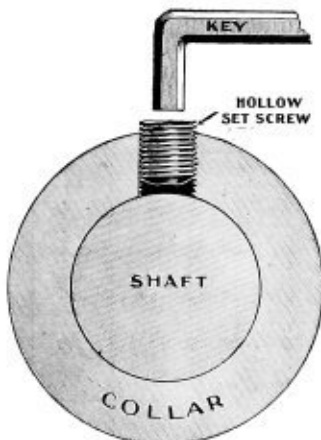
Deep holes need only be threaded at bottom, and as far up as diameter of Hollow Set Screw; balance can be counter-bored. No shoulder needed on collars and no counter-sinking, effecting a saving of material and labor.

Their life-saving feature alone is sufficient to commend Hollow Set Screws.

Protectors and Hubs do not have to be cast on revolving shafts and elsewhere to avoid protruding heads which too frequently catch workmen's clothing, causing accidents, as the HOLLOW SET SCREWS have no projections.

Hollow Set Screws can be sealed against rust and wet by filling the hole with wax; oil will also prevent rust. Wax makes the screw valuable for use in water on propellers of steamers and yachts, or similar use.

One Key Is Packed with Each Box of Screws



Diameter, inches	Thread	Length, inches	Packed	Price of Screws Per 100	PRICE OF EXTRA WRENCHES	
					For Screws	Per 100
3/8	16	3/8	100 in box	\$3.30	3/8	\$1.15
*1/2	12 and 13	1/2	100 in box	3.90	1/2	1.75
5/8	11	5/8	50 in box	5.40	5/8	2.30
3/4	10	3/4	50 in box	8.40	3/4	3.50

*We furnish 1/2-inch screws with 12 and 13 threads, and unless otherwise specified, always send 13.

IRON AND BRASS MACHINE SCREWS



Flat Head



Round Head



Fillister Head

IRON. List January 1, 1898. Price per Gross.

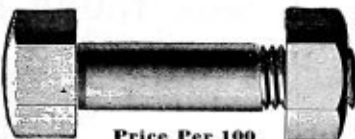
Threads to inch	48 56 64	48 56	32 36 40	30 32 36	30 32 36	24 30 32	20 24	18 20 24	16, 18, 20		16 18	14 16 18	14 16
No.	2	3	4	6	8	10	12	14	16	18	20	24	30
$\frac{3}{16}$ inch	\$0.25	\$0.25	\$0.25	\$0.29	\$0.35	\$0.43	.....	\$0.68	.....	.....	.....	.....	.....
$\frac{1}{4}$ "	.25	.25	.25	.29	.35	.43	\$0.55	.74	.....	.....	.....	.....	.....
$\frac{5}{16}$ "	.27	.27	.27	.31	.38	.46	.59	.74	\$0.95	.....	.....	.....	.....
$\frac{3}{8}$ "	.27	.27	.27	.31	.38	.46	.59	.74	.95	\$1.05	\$1.20	\$1.65	.....
$\frac{7}{16}$ "	.29	.29	.29	.33	.41	.49	.59	.74	.95	1.10	1.25	1.70	.....
$\frac{1}{2}$ "	.29	.29	.29	.33	.41	.49	.59	.74	.95	1.10	1.25	1.70	.....
$\frac{9}{16}$ "	.33	.33	.33	.36	.46	.54	.66	.81	1.00	1.15	1.35	1.90	.....
$\frac{5}{8}$ "	.33	.33	.33	.36	.46	.54	.66	.81	1.00	1.15	1.35	1.90	.....
$\frac{3}{4}$ "	.37	.37	.37	.42	.52	.63	.74	.88	1.10	1.30	1.55	2.00	\$4.00
$\frac{7}{8}$ "	.....	.48	.48	.48	.60	.72	.85	1.00	1.20	1.40	1.65	2.20	4.25
1 "	.....	.....	.55	.55	.70	.85	.97	1.15	1.35	1.55	1.80	2.55	4.50
1 $\frac{1}{4}$ "	.....	.....	.75	.75	.85	1.05	1.25	1.45	1.65	1.85	2.10	3.00	5.25
1 $\frac{1}{2}$ "	.....	.....	.75	.75	.85	1.05	1.25	1.45	1.65	1.85	2.10	3.00	5.25
1 $\frac{3}{4}$ "	.....	.....	1.00	1.00	1.15	1.35	1.60	1.80	2.00	2.20	2.50	3.60	6.00
1 $\frac{1}{2}$ "	.....	.....	1.00	1.00	1.15	1.35	1.60	1.80	2.00	2.20	2.50	3.60	6.00
1 $\frac{3}{4}$ "	.....	.....	.....	1.25	1.35	1.70	1.80	2.05	2.40	2.55	2.90	4.10	6.65
2 "	.....	.....	.....	1.50	1.65	2.00	2.10	2.30	2.75	2.90	3.35	4.65	7.35
2 $\frac{1}{4}$ "	.....	.....	.....	.....	2.00	2.30	2.50	2.75	3.10	3.25	3.70	5.00	8.00
2 $\frac{1}{2}$ "	.....	.....	.....	.....	2.35	2.75	3.00	3.25	3.45	3.65	4.15	5.75	8.90
2 $\frac{3}{4}$ "	.....	.....	.....	.....	2.75	3.25	3.40	3.65	3.85	4.15	4.75	6.45	9.85
3 "	.....	.....	.....	.....	3.25	3.75	3.90	4.25	4.65	5.15	5.75	7.45	11.00
3 $\frac{1}{4}$ "	.....	.....	.....	.....	.....	4.80	5.00	5.25	6.00	6.50	7.00	8.80	13.00
3 $\frac{1}{2}$ "	.....	.....	.....	.....	.....	5.50	5.75	6.05	6.80	7.50	8.25	10.10	15.00
3 $\frac{3}{4}$ "	.....	.....	.....	.....	.....	.....	6.40	6.75	7.55	8.40	9.25	12.55	17.50
4 "	.....	.....	.....	.....	.....	.....	7.00	7.50	8.25	9.60	10.25	13.50	20.50
4 $\frac{1}{4}$ "	.....	.....	.....	.....	.....	.....	7.75	8.25	9.20	10.60	11.75	14.75	24.00
4 $\frac{1}{2}$ "	.....	.....	.....	.....	.....	.....	.....	9.00	10.00	11.60	12.75	16.00	27.00
5 "	.....	.....	.....	.....	.....	.....	.....	10.25	11.60	13.25	15.00	20.00	30.00
6 "	.....	.....	.....	.....	.....	.....	.....	.....	16.00	18.00	20.00	25.00	37.50

BRASS. List January 1, 1898. Price per Gross.

Threads to inch	48 56 64	48 56	32 36 40	30 32 36	30 32 36	24 30 32	20 24	18 20 24	16, 18, 20		16 18	14 16 18	14 16
No.	2	3	4	6	8	10	12	14	16	18	20	24	30
$\frac{3}{16}$ inch	\$0.22	\$0.22	\$0.22	\$0.40	\$0.58	\$0.86	.....	\$1.15	.....	.....	.....	.....	.....
$\frac{1}{4}$ "	.32	.32	.32	.40	.58	.86	\$0.90	1.15	2.00	.....	.....	.....	.....
$\frac{5}{16}$ "	.35	.35	.35	.42	.62	.86	1.00	1.55	2.00	.....	.....	.....	.....
$\frac{3}{8}$ "	.35	.35	.35	.42	.62	.86	1.00	1.55	2.00	.....	.....	.....	.....
$\frac{7}{16}$ "	.39	.39	.39	.48	.68	.95	1.15	1.70	2.10	3.00	3.60	.....	.....
$\frac{1}{2}$ "	.39	.39	.39	.48	.68	.95	1.15	1.70	2.10	3.00	3.60	\$6.00	.....
$\frac{5}{8}$ "	.48	.48	.48	.57	.77	1.05	1.30	1.90	2.35	3.25	3.90	6.30	.....
$\frac{3}{4}$ "	.48	.48	.48	.57	.77	1.05	1.30	1.90	2.35	3.25	3.90	6.30	.....
$\frac{7}{8}$ "	.60	.60	.60	.70	.90	1.15	1.50	2.10	2.60	3.50	4.30	6.70	.....
1 "	.....	.....	.72	.80	1.05	1.35	1.80	2.30	2.90	3.75	4.70	7.40	\$15.75
1 $\frac{1}{4}$ "	.....	.....	.80	1.00	1.20	1.55	2.10	2.60	3.20	4.00	5.20	8.50	\$15.75
1 $\frac{1}{2}$ "	.....	.....	1.00	1.20	1.50	1.90	2.55	3.10	3.70	4.50	6.00	9.90	18.75
1 $\frac{3}{4}$ "	.....	.....	1.50	1.90	2.10	2.50	3.00	3.60	4.30	5.00	6.80	11.55	22.50
2 "	.....	.....	1.50	1.90	2.10	2.50	3.00	3.60	4.30	5.00	6.80	11.55	22.50
2 $\frac{1}{4}$ "	.....	.....	.....	2.50	2.70	3.10	3.50	4.15	5.00	5.50	7.50	12.70	24.25
2 $\frac{1}{2}$ "	.....	.....	.....	3.30	3.70	4.00	4.40	4.90	5.75	6.50	8.25	13.55	26.00
2 $\frac{3}{4}$ "	.....	.....	.....	.....	4.50	5.00	5.50	6.00	6.65	7.50	9.25	14.95	28.00
3 "	.....	.....	.....	.....	6.00	6.50	7.00	7.50	8.00	9.00	10.50	15.50	30.50
3 $\frac{1}{4}$ "	.....	.....	.....	.....	6.50	7.50	8.00	9.00	10.00	11.00	12.00	17.00	33.00
3 $\frac{1}{2}$ "	.....	.....	.....	.....	7.50	8.50	9.00	10.00	11.00	12.50	14.00	19.00	36.00
3 $\frac{3}{4}$ "	.....	.....	.....	.....	.....	12.50	13.00	14.00	15.25	17.50	19.50	22.50	32.50
4 "	.....	.....	.....	.....	.....	14.00	15.50	16.75	18.00	19.65	22.15	25.50	42.75
4 $\frac{1}{4}$ "	.....	.....	.....	.....	.....	.....	20.50	21.45	23.90	26.70	28.50	32.00	49.50
5 "	.....	.....	.....	.....	.....	.....	.....	27.90	30.40	33.00	35.00	39.50	57.50
6 "	.....	.....	.....	.....	.....	.....	.....	34.50	36.10	38.75	41.75	47.50	65.00
.....	.....	.....	.....	.....	.....	.....	.....	.....	47.20	51.50	55.25	62.00	83.00

Threads shown in black face type are standard and carried in stock.

COUPLING BOLTS



Price Per 100

The bodies of these bolts are milled, and their heads and nuts faced true with body.

Diameter of Head, inches.....	$\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Length of Head, inches.....	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter of Bolt, inches.....	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
2 inches.....	\$20.00	\$25.00	.....	.....	.....	.....	.....
2 $\frac{1}{4}$ ".....	20.50	25.75	\$32.00	.....	.....	.....	.....
2 $\frac{1}{2}$ ".....	21.00	26.50	32.00	\$38.75	.....	.....	.....
2 $\frac{3}{4}$ ".....	21.50	27.25	33.00	39.75	\$56.00	.....	.....
3 ".....	22.50	28.00	34.00	40.75	56.00	\$70.00	.....
3 $\frac{1}{4}$ ".....	23.50	28.75	35.00	41.75	57.00	71.50	\$100.00
3 $\frac{1}{2}$ ".....	23.50	29.50	36.00	42.75	58.00	73.00	100.00
3 $\frac{3}{4}$ ".....	23.50	30.25	37.00	43.75	59.00	74.50	102.50
4 ".....	24.00	31.00	38.00	44.75	60.00	76.00	105.00
4 $\frac{1}{4}$ ".....	24.50	31.75	39.00	45.75	61.00	77.50	107.50
4 $\frac{1}{2}$ ".....	25.00	32.50	40.00	46.75	62.00	79.00	110.00
4 $\frac{3}{4}$ ".....	25.50	33.25	41.00	47.75	63.00	80.50	112.50
5 ".....	.....	34.00	42.00	48.75	64.00	82.00	115.00
5 $\frac{1}{4}$ ".....	.....	.....	43.00	49.75	65.00	83.50	117.50
5 $\frac{1}{2}$ ".....	.....	.....	.....	50.75	66.00	85.00	120.00
5 $\frac{3}{4}$ ".....	.....	.....	.....	.....	67.00	86.50	122.50
6 ".....	.....	.....	.....	.....	.....	88.00	125.00
Thickness of Nut, inches.....	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Short Diameter of Nut, inches....	$\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2

MILLED IRON STUDS



Price Per 100

DIAMETER INCHES

Length inches	DIAMETER INCHES								
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	
$1\frac{1}{4}$	3.25	4.05	4.40	5.10	.....	.....	.....	.....
$1\frac{1}{2}$	3.50	4.20	4.60	5.30	6.10	.....	.....	.....
$1\frac{3}{4}$	3.65	4.35	4.80	5.50	6.30	.....	.....	.....
2	3.80	4.50	5.00	5.70	6.50	8.80	.....	.....
$2\frac{1}{4}$	3.95	4.65	5.10	5.80	6.60	9.10	.....	.....
$2\frac{1}{2}$	4.10	4.80	5.30	6.00	6.80	9.40	12.00	.....
$2\frac{3}{4}$	4.25	4.95	5.40	6.10	6.90	9.70	12.50	.....
3	4.40	5.10	5.60	6.30	7.10	10.00	13.00	17.00	
$3\frac{1}{4}$	4.55	5.25	5.70	6.40	7.20	10.30	13.50	17.75	
$3\frac{1}{2}$	4.70	5.40	5.90	6.60	7.40	10.60	14.00	18.50	
$3\frac{3}{4}$	4.85	5.55	6.00	6.70	7.50	10.90	14.50	19.25	
4	5.00	5.70	6.20	6.90	7.70	11.20	15.00	20.00	
$4\frac{1}{4}$	5.15	5.85	6.30	7.00	7.80	11.50	15.50	20.75	
$4\frac{1}{2}$	5.30	6.00	6.50	7.20	8.00	11.80	16.00	21.50	
$4\frac{3}{4}$	5.45	6.15	6.60	7.30	8.10	12.10	16.50	22.25	
5	5.60	6.30	6.80	7.40	8.20	12.40	17.00	23.00	
$5\frac{1}{4}$	5.75	6.45	6.90	7.50	8.30	12.70	17.50	23.75	
$5\frac{1}{2}$	5.90	6.60	7.10	7.60	8.40	13.00	18.00	24.50	
$5\frac{3}{4}$	6.05	6.75	7.20	7.70	8.50	13.30	18.50	25.25	
6	6.20	6.90	7.30	7.80	8.60	13.60	19.00	26.00	
Thrs'ds to inch	16	14	12	12	11	10	8	7	
Add for ea. inch	15	20	20	25	30	40	60	75	
								1.00	

H.Channon Company.Chicago.

MALLEABLE IRON THUMB SCREWS

Blank or Threaded



**Thumb Screw,
without Shoulder**

These Thumb Screws and blanks are uniform in size, easy to cut, and very strong. Screws and blanks both take same list prices (different discounts).



**Thumb Screw,
with Shoulder**



**Blank,
without Shoulder**



**Blank,
with Shoulder**

Price per Hundred

Length Under Head, inches	DIAMETER, INCHES							
	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
$\frac{1}{4}$	\$1.00	\$1.00	\$1.30	\$1.85	\$2.30	\$3.50	\$4.75	\$5.00
$\frac{3}{8}$	1.00	1.10	1.40	2.00	2.50	4.00	5.00	5.50
$\frac{1}{2}$			1.50	2.20	2.70	4.50	5.50	6.00
$\frac{3}{4}$			1.65	2.30	2.80	5.00	6.00	6.50
$1\frac{1}{4}$			1.75	2.60	3.10			
$1\frac{1}{2}$			2.00	2.90	3.40			
$2\frac{1}{4}$			2.00	3.20	3.70			
Threads per inch.....	40	24	20	18	16	14	12	



MALLEABLE IRON THUMB NUTS

Threaded or Blank



Bolt Size, Inches.....	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price per 100, Threaded..	\$0.75	\$0.75	\$0.75	\$1.00	\$1.25	\$1.50	\$2.00	\$1.00
Threads, per inch.....	40	24	20	18	16	14	12, 13	11

MALLEABLE IRON THUMB NUT BLANKS

Bolt Size, Inches.....	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price per pound.....	\$0.40	\$0.20	\$0.12	\$0.12	\$0.12	\$0.12	\$0.12	\$0.12
Number in pound.....	140	75	50	35	22	13	9	3 1/4

DROP FORGED THUMB SCREWS AND BLANKS

Price per Hundred

BLANK											THREADED										
DIAMETER, INCHES											DIAMETER AND NUMBER										
Length Under Head, inches	$\frac{3}{8}$ No. 0	$\frac{7}{8}$ No. 1	$\frac{1}{2}$ No. 2	$\frac{5}{8}$ No. 3	$\frac{3}{4}$ No. 4	$\frac{7}{8}$ No. 5	$\frac{1}{2}$ No. 6	$\frac{5}{8}$ No. 7	$\frac{3}{4}$ No. 8	$\frac{7}{8}$ No. 9	Length Under Head, inches	$\frac{1}{4}$ inch No. 0	$\frac{3}{8}$ inch No. 1	$\frac{1}{2}$ inch No. 2	$\frac{5}{8}$ inch No. 3	$\frac{3}{4}$ inch No. 4	$\frac{7}{8}$ inch No. 5	$\frac{1}{2}$ inch No. 6	$\frac{5}{8}$ inch No. 7	$\frac{3}{4}$ inch No. 8	
$\frac{1}{4}$	\$1.60	\$1.80	\$2.05	\$2.40	\$2.95	\$3.60	\$4.35	\$5.25	\$6.30	\$7.50	$\frac{1}{4}$	\$3.20	\$3.60	\$4.10	\$4.80	\$5.90	\$7.00	\$8.50	\$10.00	\$11.50	
$\frac{3}{8}$	1.70	1.90	2.15	2.50	3.05	\$3.80	\$4.75	\$5.85	\$7.00	\$8.20	$\frac{3}{8}$	3.40	3.80	4.30	5.00	6.10	\$7.60	\$9.10	\$10.60	\$12.10	
$\frac{1}{2}$	1.80	2.00	2.25	2.60	3.20	4.00	5.00	6.20	\$7.40	\$8.60	$\frac{1}{2}$	3.60	4.00	4.50	5.20	6.40	8.00	10.00	12.00	14.00	
$\frac{3}{4}$	1.90	2.10	2.35	2.75	3.40	4.25	5.30	6.55	\$7.80	\$9.00	$\frac{3}{4}$	3.80	4.20	4.70	5.50	6.80	8.50	10.60	12.80	15.00	
$1\frac{1}{4}$	2.00	2.20	2.45	2.90	3.60	4.50	5.60	6.90	8.40	10.15	$1\frac{1}{4}$	4.00	4.40	4.90	5.80	7.20	9.00	11.20	13.50	15.80	
$1\frac{1}{2}$	2.10	2.30	2.55	3.10	3.90	4.80	4.75	5.95	7.30	8.90	$1\frac{1}{2}$	4.20	4.60	5.10	6.20	7.60	9.50	11.90	14.30	16.70	
$1\frac{3}{4}$	2.40	2.70	3.00	3.65	4.55	5.65	6.90	8.40	10.35	12.60	$1\frac{3}{4}$	4.40	4.80	5.40	6.60	8.10	10.10	12.60	15.10	17.60	
2	2.60	2.85	3.20	4.00	5.00	6.20	7.60	9.20	11.15	13.40	2	5.00	5.70	6.50	7.90	9.80	12.00	14.50	17.00	19.50	
$2\frac{1}{4}$	3.05	3.70	4.60	5.70	7.05	8.65	10.50	12.60	15.05	17.60	$2\frac{1}{4}$	5.50	6.30	7.30	8.70	10.70	13.10	15.60	18.10	20.60	
$2\frac{1}{2}$	3.25	3.95	4.90	6.05	7.45	9.15	11.05	13.25	15.80	18.40	$2\frac{1}{2}$	6.00	6.90	8.00	9.50	11.60	14.10	16.70	19.30	21.90	
$2\frac{3}{4}$	3.45	4.20	5.20	6.40	7.90	9.65	11.65	13.90	16.55	19.20	$2\frac{3}{4}$	6.50	7.50	8.70	10.30	12.50	15.10	17.80	20.50	23.20	
3	3.70	4.45	5.50	6.75	8.35	10.15	12.25	14.60	17.35	20.10	3	7.00	8.10	9.40	11.10	13.40	16.10	18.90	21.70	24.50	
$3\frac{1}{4}$	4.00	4.80	5.95	7.35	9.05	11.05	13.35	15.90	18.65	21.50	$3\frac{1}{4}$	7.50	8.70	10.10	11.90	14.30	17.10	20.00	22.90	25.80	
$3\frac{1}{2}$	4.25	5.10	6.35	7.85	9.65	11.75	14.15	16.80	19.65	22.60	$3\frac{1}{2}$	8.00	9.30	10.80	12.70	15.20	18.10	21.10	24.10	27.10	
4	4.50	5.40	6.75	8.35	10.25	12.45	14.95	17.70	20.65	23.70	4	8.50	9.90	11.50	13.50	16.10	19.10	22.20	25.30	28.40	
$4\frac{1}{4}$	4.75	5.70	7.15	8.85	10.95	13.35	16.05	19.00	22.10	25.30	$4\frac{1}{4}$	9.00	10.50	12.20	14.30	17.00	20.10	23.30	26.50	29.70	
$4\frac{1}{2}$	5.00	6.00	7.55	9.35	11.65	14.25	17.15	20.30	23.60	27.00	$4\frac{1}{2}$	9.50	11.10	12.90	15.10	17.90	21.10	24.40	27.70	31.10	
5	5.25	6.30	7.95	9.85	12.35	15.15	18.25	21.60	25.10	28.60	5	10.00	11.70	13.60	15.90	18.80	22.10	25.50	29.00	32.50	
$5\frac{1}{4}$	5.50	6.60	8.35	10.45	13.15	16.15	19.45	23.00	26.60	30.20	$5\frac{1}{4}$	10.50	12.30	14.30	16.70	20.00	23.40	26.90	30.50	34.10	
$5\frac{1}{2}$	5.75	6.90	8.75	10.95	13.85	17.05	20.55	24.20	27.90	31.60	$5\frac{1}{2}$	11.00	12.90	15.00	17.50	21.00	24.50	28.10	31.70	35.40	
6	6.00	7.20	9.15	11.45	14.55	17.95	21.75	25.60	29.50	33.40	6	11.50	13.50	15.70	18.30	22.00	25.60	29.30	33.00	36.80	
Threads to inch	40	24	20	18	16	14	12	11	10	9	Threads to inch	40	24	20	18	16	14	12	11	10	9

When ordering mention style desired.



DROP FORGED THUMB NUT BLANKS

Price per Hundred

$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
\$1.75	\$2.00	\$2.25	\$2.60	\$3.25	\$4.00	\$5.00	\$6.00	\$7.25

For Price on Threaded Nuts, Double Above List

IRON WOOD SCREWS



LIST OF JULY 22, 1903. LIST PRICE PER GROSS

[illegible]

The following varieties of Iron Screws are invoiced from this list at varying discounts: Flat, round, fillister and oval head screws, dowel and felloe screws, bright, blued, brassed, bronzed, japanned, lacquered, tinned, nickel and silver plated. Also drive screws.

BRASS AND BRONZE METAL WOOD SCREWS

LIST OF JULY 22, 1903. LIST PRICE PER GROSS

[illegible]

The following varieties of brass screws are invoiced from this list at varying discounts: Flat, fillister and oval head screws of brass, copper, bronze, or phosphor bronze, bronzed, lacquered, nickel and silver plated.

STOVE BOLTS

Standard List



Flat Head



Round Head

PRICE PER 100

Flat and Round Head

Length, inches	1-8, 5-32 3-16	7-32 1-4	5-16	3-8	Length, inches	1-8, 5-32 3-16	7-32 1-4	5-16	3-8
$\frac{3}{8}$	\$0.85	\$1.20			3	\$1.50	\$2.00	\$2.70	\$4.20
$\frac{1}{2}$	.85	1.20	\$1.75	\$2.65	$3\frac{1}{4}$	1.60	2.10	2.85	4.40
$\frac{5}{8}$	.85	1.20	1.75	2.65	$3\frac{1}{2}$	1.70	2.20	3.00	4.60
$\frac{3}{4}$	.85	1.20	1.75	2.65	$3\frac{3}{4}$	1.80	2.30	3.15	4.80
$\frac{7}{8}$	.90	1.25	1.80	2.70	4	1.90	2.40	3.30	5.00
1	.90	1.30	1.85	2.75	$4\frac{1}{4}$	2.00	2.50	3.45	5.20
$1\frac{1}{8}$	.95	1.35	1.90	2.85	$4\frac{1}{2}$	2.10	2.60	3.60	5.40
$1\frac{1}{4}$	1.00	1.40	1.95	2.90	$4\frac{3}{4}$	2.20	2.70	3.75	5.60
$1\frac{3}{8}$	1.05	1.45	2.00	3.00	5	2.30	2.85	3.90	5.80
$1\frac{1}{2}$	1.10	1.50	2.05	3.10	$5\frac{1}{4}$	2.40	3.00	4.10	6.00
$1\frac{3}{4}$	1.15	1.55	2.15	3.20	$5\frac{1}{2}$	2.50	3.15	4.30	6.20
2	1.20	1.60	2.30	3.40	$5\frac{3}{4}$	2.60	3.30	4.50	6.40
$2\frac{1}{4}$	1.25	1.70	2.40	3.60	6	2.75	3.45	4.70	6.60
$2\frac{1}{2}$	1.30	1.80	2.50	3.80	$6\frac{1}{4}$	2.90	3.60	4.90	6.80
$2\frac{3}{4}$	1.40	1.90	2.60	4.00	$6\frac{1}{2}$	3.05	3.75	5.10	7.00

ELEVATOR BOLTS

Countersunk Head



Oval Head



Reliance Head



Key Head



Button Head



PRICE PER 100

Length, inches	COUNTERSUNK HEAD		
	DIAMETER, INCHES		
	$\frac{5}{16}$ and $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
$\frac{3}{8}$	\$2.20		
$\frac{1}{2}$	2.30		
$1\frac{1}{4}$	2.40		
$1\frac{1}{2}$		\$3.00	\$4.00
		3.20	4.30
		3.40	4.60

PRICE PER 100

Length, inches	$\frac{5}{16}$ AND $\frac{3}{8}$ INCH DIAMETER			
	Oval Head	Reliance Head	Key Head	Button Head
$\frac{3}{8}$	\$1.50	\$1.50	\$1.50	\$1.50
$\frac{1}{2}$	1.60	1.60	1.60	1.60
$1\frac{1}{4}$	1.60	1.60	1.60	1.60
$1\frac{1}{2}$	1.70	1.70	1.70	
$1\frac{3}{4}$	1.80	1.80	1.80	1.80

MACHINE BOLTS

With Square Heads, Square Nuts and Finished Points



Manufacturers' Standard List. In effect October 1, 1899.

Price Per 100

Length, inches	DIAMETER, INCHES										
	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
$\frac{3}{4}$ to $1\frac{1}{2}$	\$1.70	\$2.00	\$2.40	\$2.80	\$3.60	\$5.20	\$7.20	\$10.50	\$15.10	\$22.50	\$30.00
2	1.78	2.12	2.56	3.00	3.86	5.58	7.70	11.20	16.00	23.70	31.50
$2\frac{1}{2}$	1.86	2.24	2.72	3.20	4.12	5.96	8.20	11.90	16.90	24.90	33.00
3	1.94	2.36	2.88	3.40	4.38	6.34	8.70	12.60	17.80	26.10	34.50
$3\frac{1}{2}$	2.02	2.48	3.04	3.60	4.64	6.72	9.20	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	9.70	14.00	19.60	28.50	37.50
$4\frac{1}{2}$	2.18	2.72	3.36	4.00	5.16	7.48	10.20	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	10.70	15.40	21.40	30.90	40.50
$5\frac{1}{2}$	2.34	2.96	3.68	4.40	5.68	8.24	11.20	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	11.70	16.80	23.20	33.30	43.50
$6\frac{1}{2}$	2.50	3.20	4.00	4.80	6.20	9.00	12.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	12.70	18.20	25.00	35.70	46.50
$7\frac{1}{2}$	2.66	3.44	4.32	5.20	6.72	9.76	13.20	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	13.70	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	14.70	21.00	28.60	40.50	52.50
10	3.06	4.04	5.12	6.20	8.02	11.66	15.70	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	16.70	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	17.70	25.20	34.00	47.70	61.50
13	3.54	4.76	6.08	7.40	9.58	13.94	18.70	26.60	35.80	50.10	64.50
14	3.70	5.00	6.40	7.80	10.10	14.70	19.70	28.00	37.60	52.50	67.50
15	3.86	5.24	6.72	8.20	10.62	15.46	20.70	29.40	39.40	54.90	70.50
16	4.02	5.48	7.04	8.60	11.14	16.22	21.70	30.80	41.20	57.30	73.50
17	4.18	5.72	7.36	9.00	11.66	16.98	22.70	32.20	43.00	59.70	76.50
18	4.34	5.96	7.68	9.40	12.18	17.74	23.70	33.60	44.80	62.10	79.50
19	4.50	6.20	8.00	9.80	12.70	18.50	24.70	35.00	46.60	64.50	82.50
20	4.66	6.44	8.32	10.20	13.22	19.26	25.70	36.40	48.40	66.90	85.50
21	.....	.....	.....	.....	.....	.....	26.70	37.80	50.20	69.30	88.50
22	.....	.....	.....	.....	.....	.....	27.70	39.20	52.00	71.70	91.50
23	.....	.....	.....	.....	.....	.....	28.70	40.60	53.80	74.10	94.50
24	.....	.....	.....	.....	.....	.....	29.70	42.00	55.60	76.50	97.50
25	.....	.....	.....	.....	.....	.....	30.70	43.40	57.40	78.90	100.50
26	.....	.....	.....	.....	.....	.....	31.70	44.80	59.20	81.30	103.50
27	.....	.....	.....	.....	.....	.....	32.70	46.20	61.00	83.70	106.50
28	.....	.....	.....	.....	.....	.....	33.70	47.60	62.80	86.10	109.50
29	.....	.....	.....	.....	.....	.....	34.70	49.00	64.60	88.50	112.50
30	.....	.....	.....	.....	.....	.....	35.70	50.40	66.40	90.90	115.50

The following extras are to be understood as a part of this list—

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent. extra.

If both Hexagon Heads and Hexagon Nuts, 20 per cent. extra.

Joint Bolts with Oblong Nuts, 10 per cent. extra.

Bolts with Tee Heads, Askew Heads and Eccentric Heads, 20 per cent. extra.

Key Bolts, 20 per cent. extra.

Bolts with Cotter Holes, 25 per cent. extra.

Special Bolts with irregular Threads and unusual dimensions of Heads or Nuts will be charged extra, at the discretion of the manufacturer.

H.Channon Company. Chicago.

COMMON CARRIAGE BOLTS

With Short Full Size Square Under Heads, Forged Nuts and Finished Points



Manufacturers' Standard List, adopted Dec. 1, 1908.

PRICE PER 100

Length	$\frac{1}{2}$ and $\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ and $\frac{3}{4}$	$\frac{3}{4}$
1 $\frac{1}{2}$	\$1.00	\$1.40	\$1.90	\$2.20	\$3.00	\$5.20	\$7.20
1 $\frac{3}{4}$	1.04	1.46	1.98	2.29	3.00	5.20	7.20
2	1.08	1.52	2.06	2.38	3.00	5.20	7.20
2 $\frac{1}{4}$	1.12	1.58	2.14	2.47	3.00	5.20	7.20
2 $\frac{1}{2}$	1.16	1.64	2.22	2.56	3.00	5.20	7.20
2 $\frac{3}{4}$	1.20	1.70	2.30	2.65	3.11	5.37	7.43
3	1.24	1.76	2.38	2.74	3.22	5.54	7.66
3 $\frac{1}{4}$	1.28	1.82	2.46	2.83	3.33	5.71	7.89
3 $\frac{1}{2}$	1.32	1.88	2.54	2.92	3.44	5.88	8.12
3 $\frac{3}{4}$	1.36	1.94	2.62	3.01	3.55	6.05	8.35
4	1.40	2.00	2.70	3.10	3.66	6.22	8.58
4 $\frac{1}{4}$	1.44	2.06	2.78	3.19	3.77	6.39	8.81
4 $\frac{1}{2}$	1.48	2.12	2.86	3.28	3.88	6.56	9.04
4 $\frac{3}{4}$	1.52	2.18	2.94	3.37	3.99	6.73	9.27
5	1.56	2.24	3.02	3.46	4.10	6.90	9.50
5 $\frac{1}{2}$	1.64	2.36	3.18	3.64	4.22	7.24	9.96
6	1.72	2.48	3.34	3.82	4.54	7.58	10.42
6 $\frac{1}{2}$	1.80	2.60	3.50	4.00	4.76	7.92	10.88
7	1.88	2.72	3.66	4.18	4.98	8.26	11.34
7 $\frac{1}{2}$	1.96	2.84	3.82	4.36	5.20	8.60	11.80
8	2.04	2.96	3.98	4.54	5.42	8.94	12.26
8 $\frac{1}{2}$	2.12	3.08	4.14	4.72	5.64	9.28	12.72
9	2.20	3.20	4.30	4.90	5.86	9.62	13.18
9 $\frac{1}{2}$	2.28	3.32	4.46	5.08	6.08	9.96	13.64
10	2.36	3.44	4.62	5.26	6.30	10.30	14.10
11	2.52	3.68	4.94	5.62	6.74	10.98	15.02
12	2.68	3.92	5.26	5.98	7.18	11.66	15.94
13	2.84	4.16	5.58	6.34	7.62	12.34	16.86
14	3.00	4.40	5.90	6.70	8.06	13.02	17.78
15	3.16	4.64	6.22	7.06	8.50	13.70	18.70
16	3.32	4.88	6.54	7.42	8.94	14.38	19.62
18	3.64	5.36	7.18	8.14	9.82	15.74	21.46
20	3.96	5.84	7.82	8.86	10.70	17.10	23.30

PLOW BOLTS With Forged Nuts



No. 1
Key Head



No. 2
Round Head



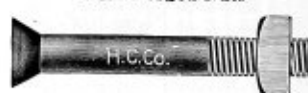
No. 3
Round Head,
Square Shank

PRICE PER 100

Length, inches	DIAMETER, INCHES					
	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
1 $\frac{1}{2}$	\$1.70	\$2.00	\$2.60	\$3.50	\$4.50	\$5.70
1 $\frac{3}{4}$	1.80	2.10	2.75	3.70	4.75	6.00
1 $\frac{1}{2}$	1.90	2.20	2.90	3.90	5.00	6.30
2	2.00	2.30	3.05	4.10	5.25	6.60
2 $\frac{1}{4}$	2.10	2.40	3.20	4.30	5.50	6.90
2 $\frac{1}{2}$	2.20	2.50	3.35	4.50	5.75	7.20
2 $\frac{3}{4}$	2.30	2.60	3.50	4.70	6.00	7.50
3	2.40	2.70	3.65	4.90	6.25	7.80
3 $\frac{1}{2}$	2.50	2.80	3.80	5.10	6.50	8.10
3 $\frac{3}{4}$	2.60	2.90	3.95	5.30	6.75	8.40
4	2.70	3.00	4.10	5.50	7.00	8.70
4 $\frac{1}{2}$	2.80	3.10	4.25	5.70	7.25	9.00

In ordering Plow Bolts, please state what style Heads are desired. Right-hand Threads will be sent unless Left-hand Threads are ordered. Special Plow Bolts made to order.

TIRE BOLTS With Forged Nuts



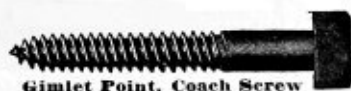
List December 28, 1899

PRICE PER 100

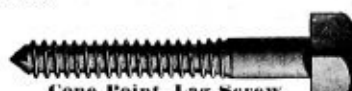
Length, inches	DIAMETER, INCHES			
	$\frac{1}{2}$ and $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$
1	\$0.60	\$0.95	\$1.40	\$2.20
1 $\frac{1}{4}$	.60	.95	1.40	2.20
1 $\frac{1}{2}$	.65	1.00	1.40	2.20
2	.70	1.05	1.47	2.20
2 $\frac{1}{4}$	.75	1.10	1.54	2.30
2 $\frac{1}{2}$	.80	1.15	1.61	2.40
2 $\frac{3}{4}$	.85	1.20	1.68	2.50
3	.90	1.25	1.75	2.60
3 $\frac{1}{4}$	.95	1.30	1.82	2.70
3 $\frac{1}{2}$	1.00	1.35	1.89	2.80
3 $\frac{3}{4}$	1.05	1.40	1.96	2.90
4	1.10	1.45	2.03	3.00
4 $\frac{1}{4}$	1.15	1.50	2.10	3.10
4 $\frac{1}{2}$	1.20	1.55	2.17	3.20
4 $\frac{3}{4}$	1.25	1.60	2.24	3.30
5	1.30	1.65	2.31	3.40
5 $\frac{1}{4}$	1.35	1.70	2.38	3.50
5 $\frac{1}{2}$	1.40	1.75	2.45	3.60
5 $\frac{3}{4}$	1.45	1.80	2.52	3.70
6	1.50	1.85	2.59	3.80

COACH AND LAG SCREWS

With Square Heads



Gimlet Point, Coach Screw



Cone Point, Lag Screw

List of November 12, 1908. Manufacturer's Standard List
Price Per Hundred

Length in inches	DIAMETER, INCHES							
	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$ and $\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1½	\$2.25	\$2.70	\$3.15	\$3.75	.....	.....	.....	.....
2	2.45	2.96	3.47	4.11	\$ 6.00	.....	.....	.....
2½	2.65	3.22	3.79	4.47	6.50	\$ 9.20	.....	.....
3	2.85	3.48	4.11	4.83	7.00	9.90	\$15.00	.....
3½	3.05	3.74	4.43	5.19	7.50	10.60	16.00	\$22.00
4	3.25	4.00	4.75	5.55	8.00	11.30	17.00	23.00
4½	3.45	4.26	5.07	5.91	8.50	12.00	18.00	24.00
5	3.65	4.52	5.39	6.27	9.00	12.70	19.00	25.00
5½	3.85	4.78	5.71	6.63	9.50	13.40	20.00	27.20
6	4.05	5.04	6.03	6.99	10.00	14.10	21.00	28.00
6½	.....	.....	6.35	7.35	10.50	14.80	22.00	29.00
7	.....	.....	6.67	7.71	11.00	15.50	23.00	31.10
7½	.....	.....	6.99	8.07	11.50	16.20	24.00	32.40
8	.....	.....	7.31	8.43	12.00	16.90	25.00	33.70
9	.....	.....	7.95	9.15	13.00	18.30	27.00	36.20
10	.....	.....	.....	9.87	14.00	19.70	29.00	38.90
11	.....	.....	.....	10.59	15.00	21.10	31.00	41.50
12	.....	.....	.....	11.31	16.00	22.50	33.00	44.10

The following extras are to be understood as a part of this list:

Hexagon Heads, 10 per cent extra.

Tee Heads, 20 per cent extra.

Skein Screws, list price, same as Lag Screws.

EXPANSION SHIELDS

Two Parts—Malleable Iron



Expansion Bolt Complete With Lag Screw



Shield Only—Sectional View

Expansion Bolts Complete—Price Per Hundred

Length in inches	DIAMETER, INCHES							
	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	1 in.
2	\$ 9.75	\$10.50	.....	.....	\$28.55	\$43.50	.....	.....
2½	9.90	10.65	\$14.30	\$21.75	28.90	44.00	.....	.....
3	10.06	10.80	14.45	22.05	29.65	45.00	.....	.....
4	10.35	11.10	14.75	22.80	30.40	46.00	.....	.....
5	10.65	11.40	15.20	23.30	31.15	47.00	\$62.00	\$71.60
6	10.96	11.70	15.60	23.80	31.90	48.00	63.00	73.50
7	.....	12.00	15.90	24.30	32.65	49.00	64.00	75.35
8	.....	.....	16.20	24.80	33.40	50.00	65.00	77.15
9	.....	.....	.....	25.30	34.20	51.00	66.00	79.00
10	.....	.....	.....	.....	34.90	52.00	67.00	80.90
11	.....	.....	.....	.....	35.65	53.00	68.00	82.80
12	.....	.....	.....	.....	.....	.....	.....	.....

Shields Only—Price Per Hundred

For Screws, Diameter, inches	LONG STANDARD		SHORT STANDARD		EXTRA SHORT STANDARD		Price Each
	Length, inches	Outside Dia., inches	Length, inches	Outside Dia., inches	Length, inches	Outside Dia., inches	
$\frac{1}{4}$	1½	$\frac{1}{2}$	..	.....	.....	.....	\$ 8.50
$\frac{3}{8}$	1¾	$\frac{5}{8}$	..	.....	.....	.....	9.00
$\frac{1}{2}$	2	¾	..	.....	.....	.....	12.00
$\frac{3}{4}$	2½	¾	..	.....	.....	.....	19.80
$\frac{1}{2}$	3	¾	..	.....	.....	.....	25.00
$\frac{3}{4}$	3½	¾	..	.....	.....	.....	26.00
$\frac{1}{2}$	4	1	..	.....	.....	.....	48.00
$\frac{3}{4}$	5	1¼	..	.....	.....	.....	60.00
1	6	1½	..	.....	.....	.....	90.00
1¼	8	1¾	..	.....	.....	.....	.....

H.Channon Company.Chicago.

COMPOSITION SCREW ANCHOR

Will Fit Any Kind of Screw



One-part Four-way Expansion



One-part Two-way Expansion

Two or Four Way—Price Per Hundred

Number, inches	Price Per 100	Screw	Length of Shield, inches	Outside Diameter, inches
$\frac{1}{8} \times \frac{1}{2}$	\$2.65	No. 5, 6, 7	$\frac{1}{2}$	$\frac{1}{4}$
$\frac{1}{8} \times \frac{3}{4}$	2.65	" 5, 6, 7	$\frac{3}{4}$	$\frac{1}{4}$
$\frac{1}{8} \times \frac{1}{2}$	3.00	" 8, 9, 10, 11	$\frac{1}{2}$	$\frac{3}{8}$
$\frac{1}{8} \times 1$	3.00	" 8, 9, 10, 11	1	$\frac{3}{8}$
$\frac{1}{8} \times 1\frac{1}{8}$	3.75	" 9, 10, 11	$1\frac{1}{8}$	$\frac{3}{8}$
$\frac{1}{4} \times \frac{1}{2}$	3.35	" 12, 13, 14	$\frac{1}{2}$	$\frac{3}{8}$
$\frac{1}{4} \times \frac{3}{4}$	3.35	" 12, 13, 14	$\frac{3}{4}$	$\frac{3}{8}$
$\frac{1}{4} \times 1\frac{1}{2}$	4.05	" 12, 13, 14	$1\frac{1}{2}$	$\frac{3}{8}$
$\frac{1}{4} \times 2\frac{1}{2}$	5.36	" 12, 13, 14	$2\frac{1}{2}$	$\frac{3}{8}$
$\frac{1}{8} \times \frac{3}{4}$	3.75	" 15, 16, 17, 18	$\frac{3}{4}$	$\frac{1}{2}$
$\frac{1}{8} \times 1\frac{1}{8}$	4.31	" 15, 16, 17, 18	$1\frac{1}{8}$	$\frac{1}{2}$
$\frac{1}{8} \times 1\frac{1}{2}$	4.50	" 15, 16, 17, 18	$1\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{8} \times 1\frac{1}{4}$	5.65	" 22, 23, 24	$1\frac{1}{4}$	$\frac{1}{2}$

DOUBLE EXPANSION BOLTS



Expansions made of steel.

Expansions Only—Price Per Hundred

Diameter of Bolt, inches	Length of Expansion, inches	Price
$\frac{1}{4}$	$1\frac{1}{2}$	\$ 8.00
$\frac{3}{8}$	$1\frac{3}{8}$	9.00
$\frac{1}{2}$	$2\frac{3}{8}$	11.00
$\frac{3}{4}$	$2\frac{1}{2}$	15.00
$\frac{1}{2}$	$2\frac{3}{8}$	18.00
$\frac{3}{4}$	$2\frac{3}{8}$	22.00
$\frac{1}{2}$	$3\frac{1}{4}$	24.00
$\frac{3}{4}$	4	35.00
$\frac{1}{2}$	$4\frac{3}{4}$	44.00
1	5	63.00

SINGLE EXPANSION BOLTS



Expansions Only—Price Per Hundred

Diameter of Bolt, inches	Length of Expansion, inches	Price
$\frac{1}{4}$	1 and $1\frac{3}{8}$	\$ 7.50
$\frac{3}{8}$	$1\frac{1}{2}$	8.50
$\frac{1}{2}$	$1\frac{3}{4}$	10.50
$\frac{3}{4}$	$1\frac{3}{4}$	14.00
$\frac{1}{2}$	$1\frac{3}{4}$	16.00
$\frac{3}{8}$	2	21.00
$\frac{1}{4}$	3	29.00
$\frac{3}{8}$	$3\frac{3}{4}$	36.00
1	$3\frac{3}{4}$	44.00

TOGGLE BOLTS



Style No. 1



Style No. 7

Style No. 1—Price Per Hundred

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
$2\frac{1}{2}$	\$3.85					
3	4.00	\$5.25	\$ 8.00	\$10.00		
$3\frac{1}{2}$	4.15	5.50	8.50	10.25		
4	4.25	5.75	9.00	10.50	\$12.00	\$14.00
5	4.40	6.00	9.50	11.50	12.50	14.50
6	4.50	6.50	10.00	12.00	13.00	15.00

Style No. 7—Price Per Hundred

Stock Sizes, inches	Price Per 100
$\frac{1}{8} \times 3$, Flat or Round Head	\$3.70
$\frac{1}{8} \times 4$, " " " "	3.80
$\frac{1}{4} \times 4$, " " " "	5.50

Put up in boxes of 100.

FINISHED CASE HARDENED AND SEMI-FINISHED HEXAGON NUTS.

Manufacturers' Standard List.



Semi-finished.

The thread and outside of each finished nut are made to an accurate gauge and to standard adopted by the U. S. Government. First class in all respects.

The semi-finished nuts correspond with the finished nuts in all dimensions; they are U. S. standard nuts, tapped and faced true on the bottom.



Finished.

Size of Bolt	Width	Thickness	Threads to Inch	Finished Case-Hardened Nuts, Price Each	Semi-Finished Nuts, Price Each	Size of Bolt	Width	Thickness	Threads to Inch	Finished Case-Hardened Nuts, Price Each	Semi-Finished Nuts, Price Each
$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	20	\$0.06	\$0.02	$1\frac{1}{4}$	2	$1\frac{1}{4}$	7	\$ 0.66	\$0.30
$\frac{5}{16}$	$\frac{11}{16}$	$\frac{5}{16}$	18	.07	.02 $\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{1}{8}$	$1\frac{3}{8}$	6	.90	.45
$\frac{3}{8}$	$\frac{11}{8}$	$\frac{3}{8}$	16	.08	.03 $\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{3}{8}$	$1\frac{1}{2}$	6	1.20	.62
$\frac{7}{16}$	$\frac{3}{4}$	$\frac{7}{16}$	14	.09	.03 $\frac{3}{4}$	$1\frac{5}{8}$	$2\frac{1}{2}$	$1\frac{5}{8}$	$5\frac{1}{2}$	1.45	.82
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	12 or (13)	.10	.04 $\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{3}{4}$	5	1.75	1.20
$\frac{9}{16}$	$\frac{7}{8}$	$\frac{9}{16}$	12	.12	.05 $\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{7}{8}$	5	2.50	1.45
$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{5}{8}$	11	.16	.06 $\frac{1}{2}$	2	$3\frac{1}{4}$	2	$4\frac{1}{2}$	3.25	1.80
$\frac{3}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	10	.22	.08 $\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{2}$	$2\frac{1}{4}$	$4\frac{1}{2}$	5.50	2.75
$\frac{7}{8}$	$1\frac{1}{2}$	$\frac{7}{8}$	9	.27	.12	$2\frac{1}{2}$	$3\frac{7}{8}$	$2\frac{1}{2}$	4	8.50	4.00
1	$1\frac{3}{8}$	1	8	.38	.16 $\frac{1}{2}$	$2\frac{3}{4}$	$4\frac{1}{4}$	$2\frac{3}{4}$	4	12.00	5.50
$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{1}{8}$	7	.50	.22	3	$4\frac{5}{8}$	3	$3\frac{1}{2}$	18.00	8.50

For nuts thinner or smaller than standard, use regular list.

For semi-finished nuts, case hardened, add 20 per cent. to the list, and use double chamfered list if rounded on top.

For finished nuts not case hardened, use regular list.

For nuts polished after case hardening, add 30 per cent. to the list.

MACHINE SCREW NUTS

TAPPED

Square or Hexagon Form

Price per Gross



Number Screw Gauge Size	Threads, per inch	IRON		BRASS	
		Square	Hexagon	Square	Hexagon
4	36	\$0.23	\$0.36	\$0.72	\$1.08
6	32	.23	.36	.72	1.08
8	32	.26	.40	.80	1.22
10	24, 32	.29	.43	.87	1.30
12	24	.32	.48	.94	1.44
14	20, 24	.36	.55	1.08	1.66
16	18	.48	.72	1.44	2.16
18	18	.62	.94	1.88	2.81
20	16, 18	.82	1.22	2.45	3.67
22	16	.93	1.44	2.70	4.32
24	16	1.06	1.58	3.17	4.75
30	14	1.50	2.30	4.55	6.91



HOT PRESSED SQUARE AND HEXAGON NUTS.



U. S. Standard List, in Effect February 1, 1899.

Width, inches.	Thick- ness, inches.	Hole, inches.	Size of Bolt, inches.	SQUARE NUTS.				HEXAGON NUTS.			
				Price per lb. in 200 lb. Kegs. cts.		Average Number in Keg of 200 lbs.		Price per lb. in 200 lb. Kegs. cts.		Average Number in Keg of 200 lbs.	
				Blank.	Tapped.	Blank.	Tapped.	Blank.	Tapped.	Blank.	Tapped.
1/2	3/4	5/8	1/2	13	15	13.800	14.760	20	22.5	17.400	18.600
3/4	1	3/4	3/4	12	13.5	7.400	7.915	18	20	9.200	9.760
1	1 1/4	1	1	10.5	11.6	5.000	5.320	14	15.6	6.000	6.400
1 1/4	1 3/4	1 1/4	1 1/4	10	10.9	3.200	3.400	13	14.3	4.000	4.250
1 3/4	2	1 3/4	1 3/4	9	9.7	2.400	2.540	11.2	12.2	3.000	3.200
2	2 1/4	2	2	9	9.6	1.600	1.690	11.2	12.1	2.128	2.275
2 1/4	2 1/2	2 1/4	2 1/4	8.7	9.2	1.360	1.440	10.6	11.2	1.540	1.620
2 1/2	2 3/4	2 1/2	2 1/2	8.5	8.9	832	880	10	10.6	998	1,050
2 3/4	3	2 3/4	2 3/4	8.4	8.8	644	678	9.9	10.5	628	665
3	3 1/4	3	3	8.4	8.8	376	397	9.9	10.5	436	460
3 1/4	3 1/2	3 1/4	3 1/4	8.4	8.8	268	284	9.9	10.5	288	305
3 1/2	3 3/4	3 1/2	3 1/2	8.4	8.8	206	220	9.9	10.5	250	260
3 3/4	4	3 3/4	3 3/4	8.5	9	146	157	10	10.7	182	190
4	4 1/4	4	4	8.8	9.4	120	127	10.3	11.1	144	150
4 1/4	4 1/2	4 1/4	4 1/4	9	9.7	95	100	10.5	11.4	116	120
4 1/2	4 3/4	4 1/2	4 1/2	9.3	10	74	77	10.8	11.7	95	100
4 3/4	5	4 3/4	4 3/4	9.5	10.3	64	67	11	12	80	84
5	5 1/4	5	5	9.7	10.6	53	55	11.2	12.3	63	65
5 1/4	5 1/2	5 1/4	5 1/4	10	11	43	45	11.7	12.9	52	54
5 1/2	5 3/4	5 1/2	5 1/2	10	11.1	36	37	11.7	13	44	45
5 3/4	6	5 3/4	5 3/4	10.3	11.5	28	29	12.2	13.6	35	36
6	6 1/4	6	6	10.5	11.8	24	25	12.4	13.9	32	33
6 1/4	6 1/2	6 1/4	6 1/4	11	12.4	21	22	13	14.6	27	27
6 1/2	6 3/4	6 1/2	6 1/2	11.5	13	16	17	13.5	15.2	18	18

For less than keg lots (200 lbs.) of a size, add 20c per cwt. for 100 lbs. or over; 50c per cwt. for less than 100 lbs.

COLD-PUNCHED CHAMFERED AND TRIMMED SQUARE AND HEXAGON NUTS,
WITH DRILLED HOLES.

U. S. Standard List.

In Effect March 19, 1901.



Width, inches.	Thick- ness, inches.	Hole, inches.	Bolt, inches.	SQUARE NUTS.				HEXAGON NUTS.			
				Price per lb. in 200 lb. Kegs. cts.		Average Number in One Keg.		Price per lb. in 200 lb. Kegs. cts.		Average Number in One Keg.	
				Blank.	Tapped.	Blank.	Tapped.	Blank.	Tapped.	Blank.	Tapped.
1/2	3/4	5/8	1/2	20	22	12.600	13.500	27	29.5	13.800	14.750
3/4	1	3/4	3/4	18	19.5	7.600	8.150	24	26	8.933	9.560
1	1 1/4	1	1	14.5	15.6	4.600	4.900	18.5	20.1	5.500	5.880
1 1/4	1 3/4	1 1/4	1 1/4	14	14.9	3.000	3.200	18	19.3	3.760	3.990
1 3/4	2	1 3/4	1 3/4	11.3	12	2.320	2.450	14	15	2.650	2.800
2	2 1/4	2	2	11.3	11.9	1.660	1.750	14	14.9	1.993	2.110
2 1/4	2 1/2	2 1/4	2 1/4	10	10.5	1.200	1.270	12.5	13.2	1.440	1.525
2 1/2	2 3/4	2 1/2	2 1/2	9.7	10.1	740	780	11.4	12	896	950
2 3/4	3	2 3/4	2 3/4	9.6	10	480	500	11.1	11.7	567	600
3	3 1/4	3	3	9.4	9.8	344	365	10.9	11.5	408	435
3 1/4	3 1/2	3 1/4	3 1/4	9.4	9.8	244	260	10.9	11.5	296	313
3 1/2	3 3/4	3 1/2	3 1/2	10.1	10.5	180	192	11.5	12.1	208	220
3 3/4	4	3 3/4	3 3/4	10.3	10.8	150	160	12	12.7	164	175
4	4 1/4	4	4	10.7	11.3	112	120	12.6	13.4	132	140
4 1/4	4 1/2	4 1/4	4 1/4	11.1	11.8	96	100	13.2	14.1	108	115
4 1/2	4 3/4	4 1/2	4 1/2	11.5	12.2	72	77	14	14.9	88	93
4 3/4	5	4 3/4	4 3/4	12	12.8	56	59	14.5	15.5	71	75
5	5 1/4	5	5	12	12.9	48	50	14.5	15.6	60	64
5 1/4	5 1/2	5 1/4	5 1/4	12.5	13.5	40	42	15	16.2	52	55
5 1/2	5 3/4	5 1/2	5 1/2	12.5	13.6	32	33	15	16.3	46	48
5 3/4	6	5 3/4	5 3/4	13.5	14.7	30	31	16	17.4	38	40
6	6 1/4	6	6	13.5	14.8	27	28	16	17.5	31	32
6 1/4	6 1/2	6 1/4	6 1/4	14	15.4	20	21	16.5	18.1	28	29
6 1/2	6 3/4	6 1/2	6 1/2	14	15.4	17	18	16.5	18.1	26	27
6 3/4	7	6 3/4	6 3/4	14.5	16	14	15	17	18.7	17	18
7	7 1/4	7	7	14.5	16.1	13	14	17	18.8	14	14
7 1/4	7 1/2	7 1/4	7 1/4	14.5	16.2	9	10	17	18.9	11	11
7 1/2	7 3/4	7 1/2	7 1/2	15.5	17.5	5	5	18	20	8	8

For less than keg lots (200 lbs.) of a size add: 20c per cwt. for 100 lbs. or over, 50c per cwt. for less than 100 lbs.

WROUGHT IRON WASHERS

Manufacturers' Standard List

In 200 lb. kegs.



Diam., inches	Hole, inches	Thickness of Wire Gauge, Number	Bolt, inches	Price per lb. in Cts.	Approximate Number in Keg	Diam., inches	Hole, inches	Thickness of Wire Gauge, Number	Bolt, inches	Price per lb. in Cts.	Approximate Number in Keg
3/16	1/4	18	3/16	14.	85,200	2 1/2	1 1/4	9	1	8.8	1,200
3/8	5/16	16	3/8	12.2	34,800	2 3/4	1 3/4	9	1 1/8	8.8	1,032
7/8	3/4	16	7/8	11.4	26,200	3	1 5/8	9	1 1/4	9.	900
1	7/8	14	1	10.5	14,400	3 1/4	1 7/8	8	1 3/8	9.	600
1 1/8	1	14	1 1/8	9.7	8,400	3 1/2	1 5/8	8	1 1/2	9.2	570
1 3/8	1 1/8	12	1 3/8	9.2	5,800	3 3/4	1 3/4	8	1 5/8	9.2	460
1 1/2	1 1/4	12	1 1/2	9.1	4,600	4	1 7/8	8	1 3/4	9.5	432
1 3/4	1 3/4	10	1 3/4	9.	2,600	4 1/4	2	8	1 7/8	9.5	366
2	1 7/8	10	2	8.8	2,200	4 1/2	2 1/8	8	2	9.5	356
2 1/4	2	9	2 1/4	8.8	1,600						

Advances: For less than Keg lots (200 lbs.) of one size, add 20c per cwt. for 100 lbs. or over; 50c per cwt. for less than 100 lbs.

LOCK WASHERS

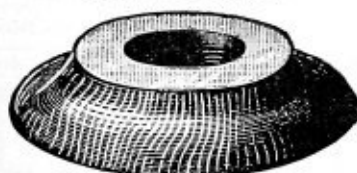
(Nut Locks)



National Pattern

Bolt, Size	PLAIN PATTERN		NATIONAL PATTERN		Bolt, Size	PLAIN PATTERN		NATIONAL PATTERN	
	Size, Steel	Price per 1000	Size, Steel	Price per 1000		Size, Steel	Price per 1000	Size, Steel	Price per 1000
3/4	3/4 x 3/4	\$5.60	3/4	1/4 x 1/4	\$ 7.15	1/4 x 1/8	\$ 9.70
7/8	7/8 x 7/8	5.80	7/8	1/4 x 1/4	8.00	1/4 x 1/8	10.50
1	1 x 1	6.30	1	1/4 x 1/4	9.00	3/8 x 1/4	16.00
1 1/8	1 1/8 x 1 1/8	6.60	1 1/8	1/4 x 1/4	9.50	3/8 x 1/4	17.00
1 1/4	1 1/4 x 1 1/4	6.90	1 1/4	1/4 x 1/4	10.50	3/8 x 1/4	20.00
1 1/2	1 1/2 x 1 1/2	7.20	1 1/2	1/4 x 1/4	11.40	3/8 x 1/4	23.00
1 3/4	1 3/4 x 1 3/4	8.60	1 3/4	1/4 x 1/4	12.30	3/8 x 1/4	26.00

CAST WASHERS



Size of Bolt, inches	Hole, inches	Diameter, inches	Thickness, inches	Approx. Weight Each, lbs.
1/2	5/8	2 1/2	1 1/2	1 1/2
3/8	3/4	2 3/4	1 1/4	3/8
3/4	3/8	3	1 1/4	1 1/2
7/8	1	3 1/2	7/8	1 1/4
1	1 1/8	4	1 1/8	1 1/2
1 1/8	1 1/4	4 1/2	1	2 1/4
1 1/4	1 3/8	5	1 1/8	3
1 1/2	1 3/4	6	1 1/4	5

Special Sizes Made to Order.

Angle Washers of Any Style a Specialty.

MALLEABLE IRON WASHERS

Nut Lock Pattern



Nos. 10 and 44



Nos. 30 and 70

Nos. 15 and 44 are positive nut lock pattern. No. 10 is the standard and No. 44 the light pattern.

Nos. 30 and 70 are nail hole pattern. The No. 70 is the light pattern.

Nut locking feature in no way interferes with their use as plain washers.

Standard diameter same as cast washers; thickness about one-half of cast washers.

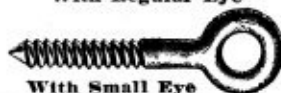
Weight about one-third as much as cast iron washers.

SCREW EYE BOLTS

Wrought Iron, Drop Forged



With Regular Eye



With Small Eye

Size, Inch	Length under Eye, Inches	"Regular Eye," Inside Diameter of Eye, Inches	"Small Eye," Inside Diameter of Eye, Inches	PRICE PER DOZEN	
				Plain	Galvanized
1/4	2	1/2	3/8	\$1.10	\$ 1.20
1/4	2 1/4	5/8	1/2	1.30	1.40
1/4	2 1/2	3/4	5/8	1.50	1.60
1/4	2 3/4	7/8	3/4	1.90	2.00
1/4	3	1	7/8	2.25	2.40
1/4	3 1/4	1 1/4	1	2.60	2.80
1/4	3 1/2	1 1/2	1 1/8	2.95	3.20
1/4	3 3/4	1 3/4	1 1/4	5.30	5.80
1/4	4	1 1/2	1 1/4	7.75	8.50
1/4	4 1/2	1 3/4	1 1/2	9.00	10.00
1	6	2	1 3/4		

NUT EYE BOLTS

Wrought Iron, Drop Forged



With Regular and Small Eyes

Size, Inch	Length under Eye, Inches	"Regular Eye," Inside Diameter of Eye, Inches	"Small Eye," Inside Diameter of Eye, Inches	PRICE PER DOZEN	
				Plain	Galvan- ized
1/4	2	1/2	3/8	\$ 1.20	\$ 1.40
1/4	2 1/4	5/8	1/2	1.40	1.60
1/4	2 1/2	3/4	5/8	1.60	1.80
1/4	2 3/4	7/8	3/4	2.10	2.30
1/4	3	1	7/8	2.40	2.60
1/4	3 1/4	1 1/4	1	2.90	3.10
1/4	3 1/2	1 1/2	1 1/8	3.20	3.60
1/4	3 3/4	1 3/4	1 1/4	5.80	6.20
1/4	4	1 1/2	1 1/4	8.00	9.00
1/4	4 1/2	1 3/4	1 1/2	11.00	12.00
1	6	2	1 3/4		

Extra Lengths

Size, Inch	Length under Eye, Inches	"Regular Eye," Inside Diameter of Eye, Inches	"Small Eye," Inside Diameter of Eye, Inches	PRICE PER DOZEN	
				Plain	Galvan- ized
1/4	4	1 1/2	1 1/4	\$ 1.60	\$ 1.80
1/4	4 1/4	1 3/4	1 1/2	1.90	2.10
1/4	4 1/2	1 3/4	1 1/2	2.10	2.30
1/4	4 3/4	1 3/4	1 1/2	2.65	2.85
1/4	5 1/4	1 3/4	1 1/2	2.95	3.15
1/4	5 1/2	1 3/4	1 1/2	3.50	3.70
1/4	5 3/4	1 3/4	1 1/2	3.90	4.30
1/4	6 1/2	1 3/4	1 1/2	6.75	7.25
1/4	8	1 3/4	1 1/2	9.75	10.75
1	9	2	1 3/4	13.00	14.00

Larger sizes and extra lengths of each size furnished to order.

EYE BOLTS TO RIVET

Wrought Iron, Drop Forged



With Regular and Small Eyes

Size, Inch	Length under Eye, Inches	"Regular Eye," Inside Diameter of Eye, Inches	"Small Eye," Inside Diameter of Eye, Inches	PRICE PER DOZEN	
				Plain	Galvan- ized
1/4	4	1 1/2	3/4	\$1.10	\$ 1.20
1/4	4 1/4	1 1/2	3/4	1.30	1.40
1/4	4 1/2	1 1/2	3/4	1.50	1.60
1/4	4 3/4	1 1/2	3/4	1.90	2.00
1/4	5 1/4	1 1/2	3/4	2.25	2.40
1/4	5 1/2	1 1/2	3/4	2.60	2.80
1/4	5 3/4	1 1/2	3/4	2.95	3.20
1/4	6	1 1/2	3/4	5.30	5.80
1/4	7	1 1/2	3/4	7.75	8.50
1	8	2	1 1/4	9.00	10.00

SCREW RING BOLTS

Wrought Iron, Drop Forged



Ring Bolts to Rivet, Same List

Size, In.	Length under Eye, Inches	Inside Diameter of Ring, Inches	PRICE PER DOZEN	
			Plain	Galvanized
1/4	2	1 1/4	\$ 1.50	\$ 1.60
1/4	2 1/4	2	2.30	2.40
1/4	2 1/2	2	2.65	2.80
1/4	2 3/4	2 1/4	3.00	3.20
1/4	3	2 1/4	3.40	3.60
1/4	3 1/4	2 1/4	4.20	4.50
1/4	3 1/2	2 1/4	5.00	5.50
1/4	3 3/4	2 1/4	8.00	8.50
1/4	4	2 3/4	12.00	13.00
1/4	4 1/4	3	17.00	19.00
1/4	4 1/2	3 1/4	22.00	25.00
1/4	4 3/4	3 1/2	32.00	36.00
1	5	3 1/2		
1 1/4	6	3 1/2		
1 1/2	7	4 3/4		
1 3/4	8	5		

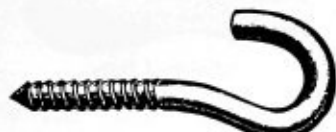
NUT RING BOLTS

Wrought Iron, Drop Forged

Size, In.	Length under Eye, Inches	Inside Diameter of Ring, Inches	PRICE PER DOZEN	
			Plain	Galvanized
1/4	2	1 1/4	\$ 1.90	\$ 2.00
1/4	2 1/4	2	2.50	2.60
1/4	2 1/2	2	2.90	3.00
1/4	2 3/4	2 1/4	3.30	3.50
1/4	3	2 1/4	3.60	3.80
1/4	3 1/4	2 1/4	4.50	4.70
1/4	3 1/2	2 1/4	5.50	6.00
1/4	3 3/4	2 3/4	9.00	9.50
1/4	4 1/2	3	13.00	14.00
1	5	3 1/2	18.00	20.00
1	6	3 3/4		

SCREW HOOKS

Galvanized Wrought Iron



Size,	1/4 inch	per doz.,	Galvanized \$0.80	Plain \$0.70
"	3/8	"	.90	.80
"	1/2	"	1.00	.90
"	5/8	"	1.40	1.20
"	3/4	"	1.80	1.50
"	7/8	"	2.30	2.00
"	1	"	2.60	2.20
"	1 1/8	"	4.20	3.70
"	1 1/4	"	6.00	5.00
"	1 1/2	"	9.00	8.00

SWIVELS

Galvanized Wrought Iron



Diameter of Iron, Inches	Entire Length, Inches	Price Each
3/8	5	\$0.40
1/2	6	.50
5/8	7 1/2	.80
3/4	8	1.00
7/8	9	1.50
1	10 1/2	2.00
1 1/8	11 1/2	2.50
1 1/4	12 1/2	3.00

SWIVELS

For Flags, Fishing, Etc.

Galvanized malleable iron and brass.

Size, No.	Entire Length, Inches	PRICE PER DOZEN.	
		Galvanized	Brass
1	1 1/2	\$0.50	\$ 0.75
2	2	.60	1.50
3	2 1/2	.75	2.25
4	3	1.00	3.00
5	3 1/2	1.25	4.00
6	5	1.50	5.00
7	6	3.50	10.00



WROUGHT IRON BARREL HOOKS



Small



Large

Small, length 6 1/2 inches.....	per pair, \$0.85	\$0.75
Large, " 10 1/4 ".....	1.00	.90

HOGSHEAD HOOKS

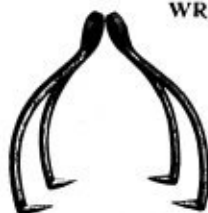
Wrought Iron

Price, blacked.....per pair, \$2.00



WROUGHT IRON HOOKS

For Tackle



Bale Hooks



Box Hooks

Diam. Iron, Inch	PRICE PER PAIR		Diam. Iron, Inch	PRICE PER PAIR	
	Galvanized	Blacked		Galvanized	Blacked
3/4	\$1.00	\$0.80	1 1/2	\$0.60	\$0.50
1	2.00	1.50	5/8	.60	.50
			3/4	.75	.60

CAN HOOKS

Wrought Iron



Size Iron, Inch	PRICE PER PAIR	
	Galvanized	Blacked
3/4	\$0.65	\$0.60
1	.80	.70
1 1/2	1.00	.85
5/8	1.25	1.10
3/4	1.75	1.50
1	2.25	2.00
1 1/2	3.00	2.50

WROUGHT IRON CHAIN HOOKS



Size,	3/4 inch, length, 24 inches.....	Galvanized each, \$0.25	Blacked \$0.20
"	1 1/2 " " 26 ".....	.50	.45
"	5/8 " " 28 ".....	.75	.65

"KEYSTONE" SAFETY SHACKLE-HOOK

Drop Forged from Bar Steel

Absolutely safe. Cannot become detached or pulled out while in use.



Close Fitting



Quick Acting

To lock and unlock, simply "lower away," giving the ring a quarter turn.

Size	For Blocks	For Wire Rope	Price Each
1 inch	7 to 9 inches	3/4 to 1 1/4 inch	\$3.00
1 1/2 "	10 " 12 "	1 1/2 " 1 3/4 inches	5.00
1 3/4 "	13 " 15 "	1 3/4 " 1 7/8 "	7.50

STEEL RAILROAD SPIKES



Size Measured Under Head	Average No. per Keg of 200 Lbs.	Ties 2 Feet Between Centers, 4 Spikes per Tie, Makes per Mile	Rails Used, Weight per Yard
5 1/2 x 9/16	375	5,870 lbs.—20 1/8 kegs	45 to 70
5 x 9/16	400	5,170 lbs.—26 "	40 to 56
5 x 1/2	450	4,660 lbs.—23 1/4 "	35 to 40
4 1/2 x 1/2	530	3,960 lbs.—20 "	28 to 35
4 x 1/2	600	3,520 lbs.—17 2/8 "	24 to 35
4 1/2 x 7/16	680	3,110 lbs.—15 1/2 "	20 to 30
4 x 7/16	720	2,910 lbs.—14 3/4 "	
3 1/2 x 7/16	900	2,350 lbs.—11 "	16 to 25
4 x 3/8	1,000	2,000 lbs.—10 1/2 "	
3 1/2 x 3/8	1,190	1,780 lbs.—9 "	16 to 20
3 x 3/8	1,240	1,710 lbs.—8 1/2 "	
2 1/2 x 3/8	1,342	1,575 lbs.—7 7/8 "	12 to 16
2 1/2 x 1/2	2,200	1,000 lbs.—5 "	8 to 10

Prices

	Base Price	Extra, per Lb.
4 1/2, 5 and 5 1/2 by 9/16	\$.....	\$.....
3 1/2, 4, 4 1/2 and 5 by 1/205
3 1/2, 4 and 4 1/2 by 7/1610
3, 3 1/2, 4 and 4 1/2 by 3/820
2 1/2 by 3/830
2 1/2, 3 and 3 1/2 by 1/245
2 by 1/270
Reverse points 1/4c extra (smallest, 3 by 3/8).		

STEEL BOAT SPIKES



	Base Price	Extra, per Lb.
3/4 inch square, 12 to 24 in length	\$.....	\$0.05
5/8 " " 8 to 16 " "05
1/2 " " 6 to 16 " "05
7/16 " " 6 to 12 " "10
3/8 " " 4 to 12 " "20
1/2 " " 4 to 8 " "35
3/4 " " 4 to 8 " "65
1 " " 3 to 3 1/2 " "90
3/8 and 5/16 shorter than 4 inches, 1/4c extra.		

TRACK BOLTS



Oval neck, button head, square or hexagon nuts.
Prices quoted on application.

DROP-FORGED MACHINE HANDLES



Unfinished Only

No.	Length Over All	Length of Shank	Diameter of Shank	Unfinished, Each	Finished, Each
00	2 1/8	1 1/2	1 1/2	\$0.07	.....
0	2 1/4	1 1/4	1 1/4	.08	.....
1	2 1/2	1 1/2	1 1/2	.10	\$0.17
2	2 3/4	1 3/4	1 3/4	.13	.18
3	3 1/4	2 1/4	2 1/4	.17	.24
4	4 1/8	3 1/8	3 1/8	.22	.36
5	5 1/8	4 1/8	4 1/8	.27	.38
6	6 1/8	5 1/8	5 1/8	.33	.32
7	6 1/2	5 1/2	5 1/2	.40	.....

HARDENED TOOL-STEEL BALLS

Made from the best tool steel, are oil tempered, free from flaws, accurate to size, and practically perfect spheres.



PRICE PER 1000

Diameter	1/4	3/8	1/2	3/4	1	1 1/4
Price	\$1.00	1.10	1.50	2.50	4.20	7.00
Diameter	1 1/2	2	2 1/2	3	3 1/2	4
Price	\$12.00	16.00	21.00	40.00	56.00	90.00
Diameter	1 1/2	2	2 1/2	3	3 1/2	4
Price	\$130.00	180.00	230.00	290.00	360.00	450.00

BRASS, BRONZE OR BELL METAL BALLS



Size, inches	Price Per 1000
1/8	\$ 16.00
3/16	13.00
1/4	9.00
5/16	9.50
3/8	10.00
1/2	12.50
5/8	18.00
3/4	25.00
7/8	42.00
1	52.00
1 1/8	75.00
1 1/4	100.00
1 1/2	120.00
1 3/4	165.00
2	240.00
2 1/4	300.00
2 1/2	350.00
2 3/4	450.00
3	700.00
3 1/4	1,000.00
3 1/2	1,250.00
3 3/4	1,800.00
4	2,300.00
4 1/4	2,500.00
4 1/2	3,200.00

COPPER RIVETS AND BURRS



RIVETS—PRICE PER POUND

Length	No. 12	No. 10	No. 9	No. 8	No. 7	No. 6	No. 5	Length	No. 12	No. 10	No. 9	No. 8	No. 7	No. 6	No. 5
$\frac{1}{4}$	\$0.58	\$0.54	\$0.52	\$0.50	\$0.49	\$0.49	\$0.49	1	\$0.58	\$0.54	\$0.52	\$0.50	\$0.49	\$0.49	\$0.49
$\frac{3}{8}$	.58	.54	.52	.50	.49	.49	.49	$1\frac{1}{8}$	.58	.54	.52	.50	.49	.49	.49
$\frac{1}{2}$	.58	.54	.52	.50	.49	.49	.49	$1\frac{1}{4}$	.58	.54	.52	.50	.49	.49	.49
$\frac{5}{8}$	.58	.54	.52	.50	.49	.49	.49	$1\frac{3}{4}$	.58	.54	.52	.50	.49	.49	.49
$\frac{3}{4}$	.58	.54	.52	.50	.49	.49	.49	2	.58	.54	.52	.50	.49	.49	.49
$\frac{7}{8}$	.58	.54	.52	.50	.49	.49	.49	.....	.....	.....	.....	.....	.....	.....	.....

BURRS—PRICE PER POUND








Number	4	5	6	7	8	9	10	12	14	15
Price	\$0.49	\$0.49	\$0.49	\$0.49	\$0.50	\$0.52	\$0.54	\$0.58	\$0.65	\$0.70

Copper Rivets with Other Style Heads, Prices on Application

ASSORTED RIVETS—In One-Pound Boxes

Size, inches	No. 7	No. 8	No. 9	No. 10	No. 12
$\frac{1}{8}$ to $\frac{3}{4}$	\$0.52	\$0.53	\$0.55	\$0.57	\$0.61
$\frac{3}{8}$ to 1	.52	.53	.55	.57	.....

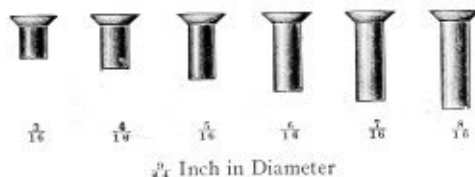
BIFURCATED OR CLINCH RIVETS

Number	116	119	151	
ILLUSTRATIONS				
Diam. Head.	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{1}{16}$	
Diam. Body.	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	
Stk. Lengths	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $\frac{1}{2}$	
$\frac{5}{16}$ to $\frac{1}{4}$	\$0.65	\$0.65	\$0.75	
$\frac{1}{4}$ to $\frac{3}{8}$	.75	.75	.85	
$\frac{3}{8}$ and $\frac{1}{2}$	.....	.85	.95	
$\frac{1}{2}$ and $\frac{3}{4}$	.....	.....	1.05	
Number	157	167	208	213
ILLUSTRATIONS				
Diam. Head.	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{7}{16}$
Diam. Body.	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Stk. Lengths	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{1}{2}$
$\frac{1}{4}$ to $\frac{1}{2}$	\$0.75	\$0.85	\$1.50	\$1.50
$\frac{1}{2}$ to $\frac{3}{4}$	.85	.95	1.50	1.50
$\frac{3}{4}$ to $\frac{1}{2}$	.85	.95	1.75	1.75
$\frac{1}{2}$ and $\frac{3}{4}$	.95	1.05	2.00	2.00
$\frac{3}{4}$ and $\frac{1}{2}$	1.05	1.15	2.25	2.25
$\frac{1}{2}$ to $\frac{1}{2}$	.....	.....	2.50	2.50
$\frac{1}{2}$ to $\frac{1}{2}$	.....	.....	2.75	2.75

For Brass or Nickeled Rivets, add \$0.10 to list

TUBULAR RIVETS

Japanned or Coppered

 $\frac{1}{4}$ Inch in Diameter

Length, inches	Price per 1,000 in Boxes of 1,000	PER DOZEN BOXES	
		50 in Box	100 in Box
$\frac{1}{8}$	\$0.95	\$0.68	\$1.25
$\frac{1}{4}$	.95	.68	1.25
$\frac{3}{8}$	.95	.68	1.25
$\frac{1}{2}$	1.05	.72	1.35
$\frac{3}{4}$	1.15	.78	1.45
$1\frac{1}{2}$	1.25	.86	1.60
$1\frac{3}{4}$	1.35	.94	1.75
$2\frac{1}{8}$	1.45	1.00	1.85

Furnished in flat or oval head as ordered.

Rivets in Cartons—Assorted

Japanned or Coppered

Length, inches	Number in Box	PRICE	
		Firsts	Seconds
$\frac{1}{8}$ to $\frac{1}{2}$	50	\$0.75	\$0.60
$\frac{1}{8}$ to $\frac{1}{2}$	100	1.40	1.10

RIVETS IN BULK

Any Style of Head

LIST PRICE IN CENTS PER POUND

Diameter	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	1	2	3	$\frac{1}{4}$	4	5	6	$\frac{3}{4}$	7	8	9	10	11	12	13	14
1 in. and longer	19	19	19½	19½	20	20	20	20	21	21	21	21	21	22	23	24	25	26	30	32
$\frac{3}{8}$ in. long	19½	19½	20	20	20½	20½	20½	20½	21½	21½	21½	21½	21½	22½	23½	24½	25½	26	30½	32½
$\frac{1}{2}$ "	19½	19½	20	20	20½	20½	20½	20½	21½	21½	21½	21½	21½	22½	23½	24½	25½	26	30½	32½
$\frac{5}{8}$ "	20	20	20½	20½	21	21	21	21	22	22	22	22	23	23	24	25	26	27	31	33
1" "	20	20	20½	20½	21	21	21	21	22	22	22	22	23	23	24	25	26	27	31	33
1½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	28	30	33	36
2" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	30	32	36
2½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
3" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
3½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
4" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
4½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
5" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
5½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
6" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
6½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
7" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
7½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
8" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
8½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
9" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
9½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
10" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
10½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
11" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
11½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
12" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
12½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
13" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
13½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
14" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
14½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
15" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
15½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
16" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
16½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
17" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
17½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
18" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
18½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
19" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
19½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
20" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
20½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
21" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
21½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
22" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
22½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
23" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
23½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
24" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
24½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
25" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
25½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
26" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
26½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
27" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
27½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
28" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
28½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
29" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
29½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
30" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
30½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
31" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
31½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
32" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
32½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
33" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
33½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
34" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
34½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
35" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
35½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
36" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
36½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
37" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
37½" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
38" "	21	21	21	21	22	22	22	22	23	23	23	23	24	24	25	26	27	29	33	36
38½" "	21	21	21	21	22	22	22	22	23	23	23	23	24							

List Extras—For Shoulder and Pointed Rivets add 2 cents per pound to list price for each specialty except Pointed Home. Intermediate lengths and diameters, list price of nearest smaller size.

Net Extras—For Tinning or Copper Plating, add 1 cent per lb. to net price. For Metallic Tinning, add 2½ cents per lb. to net price.

List Rebates—For 25 and 50-pound boxes, deduct 2 cents per pound from list price. For 100 and 200-pound kegs, deduct 4 cents per pound from list price.

SWEDES IRON BURRS

PRICE PER POUND

No.	Black	Tinned	No.	Black	Tinned	No.	Black	Tinned
1	\$0.23	\$0.23	4	\$0.24	\$0.24	9	\$0.24	\$0.44
2	.22	.33	5	.25	.35	10	.35	.46
3	.23	.33	6	.28	.38	11	.36	.46
4	.24	.33	7	.30	.40	12	.42	.53
5	.25	.33	8	.32	.42	13	.42	.53
6	.26	.33				14	.45	.55

In 1, 5, 10 and 25 pound packages and bulk in 100 pound kegs.

TINNERS' RIVETS--FLAT HEAD



IN PACKAGES OF 1,000
PRICE PER 1,000

Size	Black	Metallic Tinned	Tin Plated	Black
8 oz.	\$0.20	\$0.28	\$0.24	\$0.42
10 "	.22	.31	.27	.38
12 "	.24	.35	.30	.35
14 "	.26	.39	.33	.33
1 1/4 lb.	.29	.42	.35	.33
1 1/2 "	.29	.48	.39	.27
1 3/4 "	.33	.55	.45	.26
1 1/2 "	.37	.64	.51	.25
2 "	.42	.72	.58	.24
2 1/2 "	.55	.83	.75	.24
3 "	.60	1.05	.84	.23
3 1/2 "	.70	1.22	.98	.22
4 "	.76	1.36	1.08	.22
5 "	.90	1.65	1.36	.22
6 "	1.08	1.98	1.56	.21
7 "	1.26	2.31	1.82	.21
8 "	1.44	2.64	2.08	.21
9 "	1.53	2.88	2.25	.21
10 "	1.75	3.25	2.55	.20
12 "	1.96	3.76	2.92	.19 1/2
14 "	2.31	4.41	3.43	.19 1/2
16 "	2.64	5.04	3.92	.19 1/2

IN BULK
PRICE PER
POUND

Black	\$0.42
	.38
	.35
	.33
	.30
	.27
	.26
	.25
	.24
	.24
	.23
	.23
	.22
	.22
	.21
	.21
	.21
	.20
	.19 ^{1/2}
	.19 ^{1/2}
	.19 ^{1/2}

RIVET SETS

Made of Solid Cast Steel

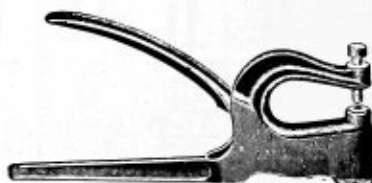


No.....	00 and 0	1 and 2	3 and 4	5 and 6	7 and 8
Price each, . . .	\$0.75	\$0.65	\$0.50	\$0.40	\$0.35

Size about

	0	1	2	3	4	5	6	7	8
$\frac{3}{8}$.	$\frac{11}{32}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{1}{2}$	$\frac{13}{64}$	$\frac{3}{16}$	$\frac{19}{64}$	$\frac{7}{16}$	$\frac{1}{2}$
Fits	copper	rivets	Nos.	7	8	10	12	..	..

THE "LITTLE GIANT" RIVETING MACHINE



Japaned finish, trimmed in gold. A well made, durable tool, workmanship and material first class in every particular.

Price each	\$1.00
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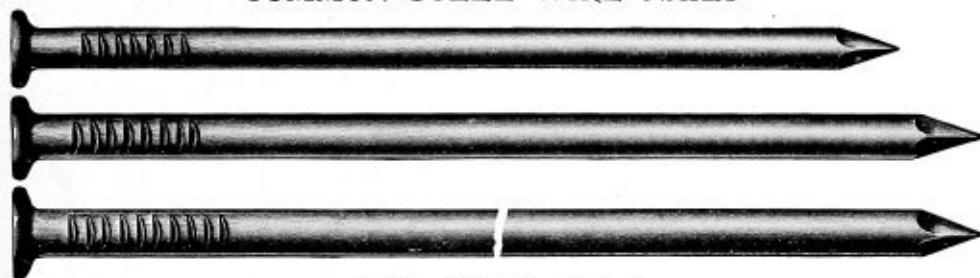
Price, each	1.00
Price per dozen	12.00

(Without Rivets)

LIST EXTRAS

For Oval or Countersunk Heads, Shoulder and Pointed, or extra length Rivets, add 10 cents per 1,000 to list price for each specialty.

COMMON STEEL WIRE NAILS



In Kegs of 100 Pounds Each

Size	Standard Gauge and Length	Approximate No. in 1 lb.	Advance Over Base Price
2d	1 in. No. 15	900	\$0.70
3d	1 1/4 " " 14	615	.45
4d	1 1/2 " " 13	322	.30
5d	1 3/4 " " 12	254	.30
6d	2 " " 12	200	.20
7d	2 1/4 " " 11	154	.20
8d	2 1/2 " " 10	106	.10
9d	2 3/4 " " 10	85	.10
10d	3 " " 9	74	.05
12d	3 1/4 " " 9	57	.05
16d	3 1/2 " " 8	46	.05
20d	4 " " 6	29	Base
30d	4 1/2 " " 5	23	"
40d	5 " " 4	18	"
50d	5 1/2 " " 3	13 1/2	"
60d	6 " " 2	10 1/2	"

Also furnished in bulk

COATED NAILS



In Kegs

Suitable for Either Machine or Hand Driving

Size	Number Coated Nails in Keg	Advance over Base
2d	85,700	\$0.70
3d	54,300	.45
4d	29,800	.30
5d	25,500	.30
6d	17,900	.20
7d	15,300	.20
8d	10,100	.10
9d	8,900	.10
10d	6,600	.05
12d	6,200	.05
16d	4,900	.05
20d	3,100	Base
30d	2,400	"
40d	1,800	"
50d	1,300	"
60d	1,100	"

Note:—There are approximately the same number of coated nails in a keg as common nails, but weight is less.

CASING NAILS



Size	Standard Gauge and Length	Approximate No. in 1 lb.	Advance Over Base Price
2d	1 in. No. 16	1140	\$1.00
3d	1 1/4 " " 15	675	.70
4d	1 1/2 " " 15	567	.50
6d	2 " " 13	260	.35
8d	2 1/2 " " 12	160	.25
10d	3 " " 11	108	.15
16d	3 1/2 " " 10	69	.15
20d	4 " " 9	50	.15

FINISHING NAILS



Size	Standard Gauge and Length	Approximate No. in 1 lb.	Advance Over Base Price
2d	1 in. No. 17	1558	\$1.15
3d	1 1/4 " " 16	884	.85
4d	1 1/2 " " 16	767	.65
6d	2 " " 14	359	.45
8d	2 1/2 " " 13	214	.35
10d	3 " " 12	134	.25
16d	3 1/2 " " 11	91	.25
20d	4 " " 10	61	.25

SHINGLE NAILS



Size	Standard Gauge and Length	Approx. No. in 1 lb.	Advance Over Base Price
3d	1 1/4 in. No. 13	380	\$0.45
4d	1 1/2 in. No. 12	256	.30

GALVANIZED SHINGLE NAILS

Size	Standard Gauge and Length	Approx. No. in 1 lb.	Advance Over Base Price
3d	1 1/4 in. No. 13	429	\$0.95
4d	1 1/2 in. No. 12	274	.80

BARBED ROOFING NAILS



Size	Standard Gauge and Length	Approx. No. in 1 lb.	Advance Over Base Price
3/4 in. Barb. Rf.	3/4 in. No. 13	648	\$0.75
7/8 " " "	7/8 " " 12	413	.65
1 " " "	1 " " 12	384	.60
1 1/8 " " "	1 1/8 " " 12	339	.60
1 1/4 " " "	1 1/4 " " 11	231	.55
1 1/2 " " "	1 1/2 " " 10	154	.45
1 3/4 " " "	1 3/4 " " 10	151	.45
2 " " "	2 " " 9	103	.35

FINE NAILS



Size	Standard Gauge and Length	Approx. No. in 1 lb.	Advance Over Base Price
2d Fine	1 in. No. 17	1440	\$1.00
3d "	1 1/8 " " 15	920	.50
3d Ex. Fine	1 1/8 " " 16	.....	.65

CUT TACKS—BLUED STEEL

Flat Head

In dozens—1/4 and 1/2 weight.

In bulk—100-lb. kegs, 25- or 10-lb. boxes, 1- and 5-lb. papers.

Size	PRICE PER DOZEN		Per lb., Bulk
	1/4 Weight	1/2 Weight	
2	.....	\$1.50	\$2.01
3	\$0.95	1.60	1.61
4	1.10	1.85	1.46
6	1.35	2.35	1.36
8	1.60	2.95	1.26
10	1.90	3.60	1.21
12	2.20	4.25	1.16
14	2.50	5.00	1.16
16	2.80	5.70	1.16
18	3.20	6.40	1.16

CLOUT NAILS



Length, inches	Gauge	Count Per Pound	Advance Over Base
3/4	No. 15	1160	\$1.30
7/8	No. 14	808	1.15
1	No. 14	705	1.00
1 1/8	No. 14	628	.90
1 1/4	No. 13	423	.80
1 3/8	No. 13	390	.75
1 1/2	No. 13	350	.60

HORSE SHOE NAILS

Made of Open Hearth Steel, Cold Rolled Process



Packed as follows: In 1/2-lb. and 1-lb. paste-board boxes, 100 lbs. in a case. In bulk, 100 lbs. in a keg.

No.	3	4	4 1/2	5	6	7	8	9	10	11	12
Price per pound..	\$0.75	.35	.30	.22	.19	.18	.17	.16	.16	.15	.15

WROUGHT IRON STAPLES

Bright or Galvanized, All Made of No. 9 Wire, in Kegs Containing 100 Pounds



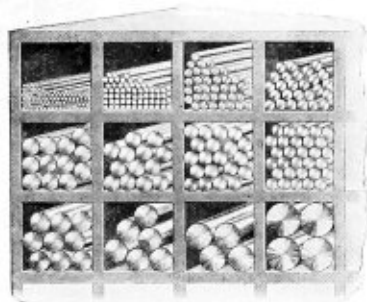
1 1/4 in.

1 1/2 in.

Length	Approximate Number to lb.	Price
3/8	120	Market
1	108	"
1 1/8	96	"
1 1/4	87	"
1 1/2	72	"
1 3/4	65	"
2	58	"

GOLD MEDAL DRILL ROD

Best Quality Crucible Tool Steel, Absolutely Accurate to Size for Drills, Taps, Reamers and Punches, and
All Small Tools Requiring Steel of the Very Highest Grade.

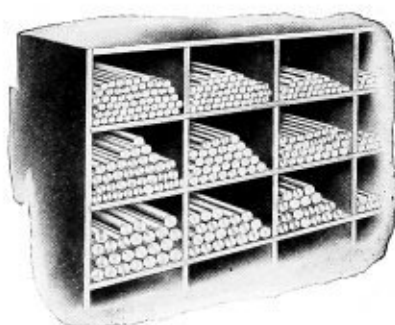


3 foot Lengths Carried in Stock

Size	Equivalent Decimals of an Inch	Price per Lb.	Size	Equivalent Decimals of an Inch	Price per Lb.	Size	Equivalent Decimals of an Inch	Price per Lb.	Size	Equivalent Decimals of an Inch	Price per Lb.
3/4	0.750	\$0.55	O	0.316	\$0.75	16	0.177	\$0.83	48	0.076	\$1.20
7/16	0.7343	.55	N	0.3125	.75	17	0.173	.83	49	0.073	1.20
3/8	0.7187	.55	M	0.302	.75	18	0.1718	.83	50	0.07	1.20
5/16	0.703	.55	L	0.2968	.75	19	0.1695	.83	51	0.067	1.45
1/4	0.6875	.55	K	0.295	.75	20	0.166	.83	52	0.0635	1.45
3/16	0.6718	.55	J	0.290	.75	21	0.161	.83	53	0.0625	1.45
5/32	0.6562	.55	I	0.2812	.75	22	0.159	.83	54	0.059	1.45
3/32	0.6406	.55	H	0.281	.75	23	0.1562	.83	55	0.055	1.45
1/8	0.625	.55	G	0.277	.75	24	0.157	.83	56	0.052	1.80
7/32	0.6093	.55	F	0.272	.75	25	0.154	.83	57	0.0468	1.80
1/4	0.5937	.55	E	0.266	.75	26	0.152	.83	58	0.0465	1.80
5/16	0.578	.55	D	0.2656	.75	27	0.1495	.83	59	0.043	1.80
3/8	0.5625	.55	C	0.261	.75	28	0.147	.83	60	0.042	2.10
1/2	0.5468	.55	B	0.257	.75	29	0.144	.83	61	0.041	2.10
5/8	0.5312	.55	A	0.250	.75	30	0.1406	.83	62	0.04	2.10
3/4	0.5156	.55	1	0.250	.75	31	0.1405	.83	63	0.039	2.40
7/8	0.500	.60	2	0.246	.75	32	0.136	.83	64	0.038	2.40
1	0.4843	.60	3	0.242	.75	33	0.1285	.83	65	0.037	2.70
1 1/8	0.4687	.60	4	0.238	.75	34	0.125	.83	66	0.036	2.70
1 1/4	0.4531	.60	5	0.2343	.75	35	0.120	.90	67	0.035	2.70
1 3/8	0.4375	.60	6	0.234	.75	36	0.116	.90	68	0.033	3.00
1 1/2	0.4218	.75	7	0.227	.75	37	0.113	.90	69	0.0312	3.00
1 3/4	0.413	.75	8	0.221	.75	38	0.111	.90	70	0.032	3.00
2	0.4062	.75	9	0.2187	.75	39	0.1093	.90	71	0.031	3.00
2 1/8	0.404	.75	10	0.213	.75	40	0.110	.90	72	0.029	3.30
2 1/4	0.397	.75	11	0.209	.75	41	0.1065	.90	73	0.028	3.30
2 3/8	0.3906	.75	12	0.205	.75	42	0.104	.90	74	0.021	3.60
2 1/2	0.386	.75	13	0.2031	.75	43	0.1015	.90	75	0.025	3.60
2 3/4	0.377	.75	14	0.204	.75	44	0.0995	1.05	76	0.024	3.60
3	0.375	.75	15	0.201	.75	45	0.098	1.05	77	0.0225	3.90
3 1/8	0.368	.75	16	0.199	.75	46	0.096	1.05	78	0.021	4.05
3 1/4	0.3593	.75	17	0.196	.75	47	0.0937	1.05	79	0.02	4.20
3 3/8	0.358	.75	18	0.1935	.75		0.0935	1.05	80	0.018	4.50
3 1/2	0.348	.75	19	0.191	.75		0.089	1.05		0.0156	4.50
3 3/4	0.3437	.75	20	0.1875	.75		0.086	1.05		0.016	4.80
4	0.339	.75	21	0.183	.75		0.082	1.05		0.0145	5.10
4 1/8	0.332	.75	22	0.185	.75		0.081	1.05		0.0135	5.40
4 1/4	0.3281	.75	23	0.182	.75		0.0781	1.20			
4 3/8	0.323	.75	24	0.180	.75		0.0785	1.20			

Up to 1 inch diameter, by 64ths of an inch..... per lb. \$0.50

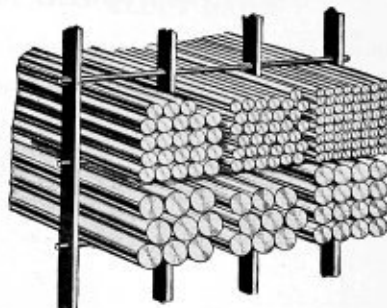
BESSEMER STEEL ROD COPPER PLATED



We carry these rods in four foot lengths. They are drawn round and true to size from refined steel, and are free from flaws, seams, hard spots and sand. They are soft and easy to work and much stiffer than iron rods.

Gauge	Advance over base Per 100 Pounds
No. 16 ($\frac{1}{16}$)	\$1.85
No. 15	1.85
No. 14 ($\frac{1}{8}$)	1.05
No. 13	1.05
No. 12	.60
No. 11	.50
No. 10	.50
No. $\frac{1}{2}$	.50
No. $\frac{3}{8}$	.10
No. $\frac{1}{16}$ to 1" by 32nds	Base

HARD BRASS ROD



NOT LESS THAN 2 FEET LENGTHS
BROWN & SHARPE'S GAUGE THE STANDARD

Description	Price per Pound
$\frac{1}{4}$ inch to 1 inch diameter, both inclusive...	\$0.24
No. 8, and less than $\frac{1}{4}$ inch diameter.....	.26
Over 1 inch diameter,.....	.27
Smaller than No. 8 to No. 11, inclusive,	.30

Hexagon, Octagon and Square, 2 cents per pound advance over Round Rods.

Rectangular, Half-round and fancy shapes, not less than 4 cents advance over Round Rods.

(Half Round and Rectangular Rods are measured the thinner way.)

Rods less than 2 ft. lengths, add to above prices for cutting.

12 in. to 24 in.	9 in. to 12 in.	6 in. to 9 in.	4 in. to 6 in.
\$0.02	\$0.03	\$0.04	\$0.05
	2 in. to 4 in.	1 in. to 2 in.	
	\$0.08	\$0.12	

Shorter than 1 inch, special.

Add to above for Gilding and Bronze Rods...\$0.08 per pound

Smaller than No. 11, see Wire List.

ROLL AND SHEET BRASS

BROWN & SHARPE'S GAUGE THE STANDARD

COMMON HIGH BRASS	Wider than and including	In. 2 12	In. 3 14	In. 4 16	In. 5 18	In. 6 20	In. 7 22	In. 8 24	In. 9 26	In. 10 28	In. 11 30	In. 12 32	In. 13 34	In. 14 36	In. 15 38	In. 16 40	Special purpose nuts and washers
To No. 22, inclusive		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
No. 22, 23 and 24.....		.22	.23	.25	.27	.29	.31	.33	.35	.39	.42	.46	.50	.55	.60	.65	Special purpose nuts and washers
" 25 and 26.....		.23	.24	.26	.28	.30	.32	.34	.37	.40	.43	.47	.51	.56	.61	.68	
" 27 and 28.....		.25	.24 1/2	.27	.29	.31	.33	.35	.38	.41	.44	.48	.52	.57	.63	.71	
		.25	.26	.28	.30	.32	.34	.36	.39	.42	.45	.49	.53	.58	.65	.75	

STANDARD CLASSIFICATION OF MILD OR SOFT STEEL

OPEN HEARTH AND BESSEMER

Intermediate Sizes Take Next Higher Extra

ROUNDS TO $7\frac{1}{16}$ IN.—SQUARES TO $4\frac{1}{2}$ IN.

		Base	extra
$\frac{3}{4}$ to $3\frac{1}{16}$ inches.....		\$0.10	
$\frac{5}{8}$ " $\frac{11}{16}$ inch.....		.20	
$\frac{1}{2}$ " $\frac{1}{2}$ ".....		.40	
$\frac{7}{16}$ " ".....		.50	
$\frac{3}{8}$ " ".....		.60	
$\frac{1}{4}$ " ".....		.70	
$\frac{3}{16}$ " ".....		.80	
$\frac{1}{8}$ " ".....		1.00	
$\frac{1}{16}$ " ".....		1.50	
$\frac{1}{32}$ " ".....		2.00	
$\frac{1}{64}$ " ".....		2.50	
$3\frac{1}{8}$ to $3\frac{1}{16}$ inches.....		.15	
$3\frac{3}{8}$ " $4\frac{1}{16}$ ".....		.25	
$4\frac{1}{8}$ " $4\frac{1}{16}$ ".....		.30	
$4\frac{3}{8}$ " 5 ".....		.40	
$5\frac{1}{8}$ " $5\frac{1}{2}$ ".....		.50	
$5\frac{3}{8}$ " 6 ".....		.75	
$6\frac{1}{8}$ " $6\frac{1}{2}$ ".....		1.00	
$6\frac{3}{8}$ " $7\frac{1}{16}$ ".....		1.25	

FLAT BARS AND HEAVY BANDS

		Base	extra
1 to 6 in. x $\frac{3}{8}$ to 1 in.....		\$0.20	
1 " 6 " x $\frac{1}{4}$ " $\frac{3}{4}$ ".....		.40	
1 " 6 " x $\frac{1}{4}$ " $\frac{1}{2}$ ".....		.50	
1 " 6 " x $\frac{1}{4}$ " $\frac{1}{4}$ ".....		.50	
1 " 6 " x $\frac{1}{4}$ " $\frac{1}{8}$ ".....		.70	
1 " 6 " x $\frac{3}{8}$ " $\frac{1}{2}$ ".....		1.00	
1 " 6 " x $\frac{3}{8}$ " $\frac{1}{4}$ ".....		1.20	
1 " 6 " x $\frac{3}{8}$ " $\frac{1}{8}$ ".....		2.00	
1 " 6 " x $1\frac{1}{16}$ " $1\frac{1}{2}$ ".....		.10	
1 " 6 " x $1\frac{1}{4}$ " 2 ".....		.20	
1 " 6 " x $1\frac{1}{2}$ " 2 ".....		.30	
1 " 6 " x $2\frac{1}{2}$ in.....		.40	

Above extra not applicable on steel tires.

LIGHT BARS AND BANDS

		Base	extra
$1\frac{1}{2}$ to 6 in. x Nos. 7, 8, 9 and $\frac{1}{16}$ in.....		\$0.40	
$1\frac{1}{2}$ " 6 " x " 10, 11, 12 and $\frac{1}{8}$ in.....		.60	
1 " $1\frac{1}{16}$ " x " 7, 8, 9 and $\frac{1}{16}$ in.....		.50	
1 " $1\frac{1}{8}$ " x " 10, 11, 12 and $\frac{1}{8}$ in.....		.70	
1 " $1\frac{1}{4}$ " x " 7, 8, 9 and $\frac{3}{16}$ in.....		.70	
1 " $1\frac{1}{2}$ " x " 10, 11, 12 and $\frac{1}{4}$ in.....		.80	
1 " $1\frac{3}{4}$ " x " 7, 8, 9 and $\frac{1}{2}$ in.....		1.00	
1 " $1\frac{7}{8}$ " x " 10, 11, 12 and $\frac{3}{8}$ in.....		1.20	
1 " 2 " x " 7, 8, 9 and $\frac{1}{2}$ in.....		1.20	
1 " 2 " x " 10, 11, 12 and $\frac{1}{2}$ in.....		1.30	
$\frac{1}{2}$ in. x Nos. 7, 8, 9 and $\frac{1}{16}$ in.....		1.30	
$\frac{1}{2}$ " x " 10, 11, 12 and $\frac{1}{8}$ in.....		1.50	
$\frac{1}{4}$ " x $\frac{1}{2}$ in.....		1.80	
$\frac{3}{8}$ " x Nos. 7, 8, 9 to $\frac{1}{8}$ in.....		1.90	
$\frac{3}{8}$ " x " 10 and $\frac{1}{8}$ in.....		2.40	

OVALS

		Base	extra
$\frac{3}{4}$ to $1\frac{1}{2}$ inches.....		\$0.30	
$\frac{3}{8}$ inch.....		.50	
$\frac{1}{2}$ ".....		.60	
$\frac{1}{4}$ ".....		.80	

HALF OVALS

	Extra	Extra
$\frac{7}{8}$ to $4\frac{1}{2}$ to $\frac{1}{2}$	\$0.50	
$2\frac{1}{2}$ x $\frac{5}{8}$ (special) ..	.50	
$\frac{3}{4}$ x $\frac{1}{2}$.....	.80	
$\frac{5}{8}$ x $\frac{1}{2}$ and $\frac{1}{4}$	1.00	
$\frac{1}{2}$ x $\frac{1}{4}$	1.30	
$\frac{1}{4}$ x No. 13.....	1.80	
$\frac{1}{2}$ x $\frac{1}{8}$	1.30	
$\frac{1}{4}$ x $\frac{1}{4}$	2.10	
$\frac{3}{8}$ x $\frac{1}{2}$ to $\frac{1}{4}$	2.50	

HALF ROUNDS

	Extra	Extra
$\frac{7}{8}$ to 2.....	\$0.50	
$\frac{3}{4}$.....	.80	
$\frac{5}{8}$ and $\frac{1}{4}$	1.00	
$\frac{1}{2}$	1.30	
$\frac{1}{4}$	2.10	
$\frac{3}{8}$	2.50	
$\frac{1}{16}$	2.60	

EXTRAS FOR CUTTING TO SPECIFIED LENGTHS

Hot Sawing or Shearing to lengths over 24 inches and under 5 feet.....	\$0.10
Hot Sawing or Shearing to lengths 12 inches to 24 inches, inclusive.....	.20
Machine Cutting to lengths over 24 inches.....	.20
Machine Cutting to lengths 12 inches to 24 inches, inclusive.....	.40
For Machine Cutting to lengths less than 12 inches extra will be furnished on application, but will not be less than.....	.60

NORWAY AND SWEDISH IRON CLASSIFICATION

ROUNDS AND SQUARES

	Per 100 lbs.	Base	extra
1 to $1\frac{1}{4}$ inches.....		\$0.10	
2 to $2\frac{1}{4}$ ".....		.20	
$2\frac{1}{2}$ to $3\frac{1}{4}$ ".....		.50	
$3\frac{1}{2}$ to 4 ".....		.10	
$\frac{3}{4}$ to $\frac{7}{8}$ inch.....		.20	
$\frac{1}{2}$ to $\frac{3}{4}$ ".....		.30	
$\frac{1}{4}$ to $\frac{1}{2}$ ".....		.40	
$\frac{1}{8}$ inch.....		.60	
$\frac{1}{16}$ ".....		1.00	
$\frac{1}{32}$ ".....		3.00	

FLATS

	Base	extra
$1\frac{1}{2}$ to 4 by $\frac{3}{4}$ to 1 inch thick.....	\$0.10	
$4\frac{1}{2}$ to 6 by $\frac{3}{4}$ to 1 " ".....	.20	
$1\frac{1}{2}$ to 6 by $1\frac{1}{2}$ to $1\frac{1}{2}$ inches thick.....	.50	
$2\frac{1}{2}$ to 6 by 2 inches thick.....	.10	
$1\frac{1}{2}$ and $1\frac{1}{4}$ by $\frac{3}{4}$ to 1 inch thick.....	.20	
1 and $1\frac{1}{2}$ by $\frac{3}{4}$ to $\frac{3}{4}$ " ".....	.40	
$\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ by $\frac{3}{4}$ to $\frac{3}{4}$ inch thick.....	.20	
$1\frac{1}{2}$ to 6 by $\frac{1}{2}$ and $\frac{1}{2}$ inch thick.....	.30	
1 to $1\frac{1}{2}$ by $\frac{1}{2}$ and $\frac{1}{2}$ " ".....	.50	
$\frac{3}{4}$ and $\frac{3}{4}$ by $\frac{1}{2}$ and $\frac{1}{2}$ inch thick.....	1.00	
$\frac{1}{2}$ and $\frac{1}{2}$ by $\frac{1}{2}$ and $\frac{1}{2}$ " ".....	.50	
1 to 2 by $\frac{1}{2}$ inch thick.....	.80	
$\frac{3}{4}$ and $\frac{3}{4}$ by $\frac{1}{2}$ inch thick.....	1.20	
$\frac{1}{2}$ and $\frac{1}{2}$ by $\frac{1}{2}$ " ".....		

NATIONAL IRON CLASSIFICATION

Adopted January 6, 1896.

ROUNDS AND SQUARES.

	Per 100 lbs.
1 to 1 $\frac{1}{8}$ inches.....Base	
2 to 2 $\frac{1}{2}$ ".....extra, \$0.20	
3 to 3 $\frac{1}{2}$ "....."	.50
3 $\frac{3}{8}$ to 4 "....."	.80
4 $\frac{1}{8}$ to 4 $\frac{1}{2}$ "....."	1.00
4 $\frac{3}{8}$ to 5 "....."	1.30
5 $\frac{1}{8}$ to 6 "....."	1.80
6 $\frac{1}{8}$ to 6 $\frac{1}{2}$ "....."	2.20
6 $\frac{3}{8}$ to 7 "....."	2.50
7 $\frac{1}{8}$ to 7 $\frac{1}{2}$ inch....."	.10
7 $\frac{3}{8}$ to 8 "....."	.20
8 $\frac{1}{8}$ to 8 $\frac{1}{2}$ "....."	.30
8 $\frac{3}{8}$ to 9 "....."	.40
9 $\frac{1}{8}$ to 9 $\frac{1}{2}$ "....."	.50
9 $\frac{3}{8}$ to 10 "....."	.70
10 $\frac{1}{8}$ to 10 $\frac{1}{2}$ "....."	.90
10 $\frac{3}{8}$ to 11 inch....."	1.40
11 $\frac{1}{8}$ "....."	2.50

FLATS.

	Per 100 lbs.
1 $\frac{1}{2}$ to 4 by 3 $\frac{1}{2}$ to 1 inch.....Base	
4 $\frac{1}{4}$ to 6 by 3 $\frac{1}{2}$ to 1 ".....extra, \$0.10	
4 $\frac{1}{4}$ to 6 by 1 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.40
6 $\frac{1}{4}$ to 8 by 3 $\frac{1}{2}$ to 1 "....."	.60
6 $\frac{1}{4}$ to 8 by 1 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.60
8 $\frac{1}{4}$ to 10 by 3 $\frac{1}{2}$ to 1 "....."	.80
1 $\frac{1}{2}$ to 4 by 1 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.30
2 to 4 by 1 $\frac{1}{2}$ to 2 "....."	.50
4 $\frac{1}{4}$ to 6 by 1 $\frac{1}{2}$ to 2 "....."	.60
6 $\frac{1}{4}$ to 8 by 1 $\frac{1}{2}$ to 2 "....."	.80
8 $\frac{1}{4}$ to 10 by 1 $\frac{1}{2}$ to 2 "....."	.90
8 $\frac{1}{4}$ to 10 by 1 $\frac{1}{2}$ to 2 "....."	1.00
2 to 4 by 2 $\frac{1}{2}$ to 3 "....."	.60
4 $\frac{1}{4}$ to 6 by 2 $\frac{1}{2}$ to 3 "....."	.80
6 $\frac{1}{4}$ to 8 by 2 $\frac{1}{2}$ to 3 "....."	1.00
1 $\frac{1}{2}$ to 1 $\frac{1}{2}$ by 3 $\frac{1}{2}$ to 1 "....."	.10
1 to 1 $\frac{1}{2}$ by 3 $\frac{1}{2}$ to 3 $\frac{1}{2}$ "....."	.20
3 $\frac{1}{4}$ to 3 $\frac{1}{4}$ by 3 $\frac{1}{2}$ to 3 $\frac{1}{2}$ "....."	.40
5 $\frac{1}{8}$ to 5 $\frac{1}{8}$ by 3 $\frac{1}{2}$ to 3 $\frac{1}{2}$ "....."	.50
7 $\frac{1}{8}$ to 7 $\frac{1}{8}$ by 3 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.90

OVAL IRON.

	Per 100 lbs.
3 $\frac{1}{8}$ to 1 $\frac{1}{2}$ inches.....extra, \$0.40	
3 $\frac{1}{4}$ to 1 $\frac{1}{4}$ "....."	.50
3 $\frac{3}{8}$ to 1 $\frac{1}{2}$ "....."	.60
3 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.80
3 $\frac{3}{4}$ to 1 $\frac{1}{2}$ "....."	1.10
3 $\frac{1}{2}$ to 1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ inch....."	1.00
3 $\frac{3}{4}$ to 1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ "....."	1.20

HALF OVAL AND HALF ROUND.

	Per 100 lbs.
2 $\frac{1}{4}$ to 3 inches.....extra, \$0.60	
3 $\frac{1}{8}$ to 2 "....."	.50
3 $\frac{1}{4}$ to 1 $\frac{1}{2}$ "....."	.70
3 $\frac{3}{8}$ to 1 $\frac{1}{2}$ "....."	.90
3 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	1.20
3 $\frac{3}{4}$ to 1 $\frac{1}{2}$ "....."	2.50
3 $\frac{1}{2}$ inch....."	3.50
3 $\frac{3}{4}$ "....."	4.50

Half oval, less than $\frac{1}{4}$ their width in thickness, extra price.

TOOL STEEL CLASSIFICATION.

All dimensions inclusive.

ROUND, SQUARE, AND OCTAGON.

% to 2 inches.....Base	Per lb.	% to 1 $\frac{1}{2}$ inch.....extra, \$0.002	Per lb.
2 $\frac{1}{8}$ to 3 inches, extra, \$0.01	.01	1 $\frac{1}{8}$ to 1 $\frac{1}{2}$ inch....."	.01
3 $\frac{1}{8}$ to 4 "....."	.02	1 $\frac{1}{4}$ and 1 $\frac{1}{2}$ inch....."	.02
4 $\frac{1}{8}$ to 5 "....."	.02	1 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "....."	.03
5 $\frac{1}{8}$ to 6 "....."	.03	1 $\frac{1}{2}$ inch....."	.05
6 $\frac{1}{8}$ to 7 "....."	.03	1 $\frac{1}{2}$ "....."	.10
7 $\frac{1}{8}$ to 8 "....."	.03	1 $\frac{1}{2}$ "....."	.18

FLAT.

% to 2 inches thick by 1 $\frac{1}{2}$ to 2 inches wide.....Base	Per lb.	% to 2 inches thick by 1 $\frac{1}{2}$ to 2 inches wide.....extra, \$0.02	Per lb.
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ inch.....extra, \$0.20	.15	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ "....."	.04	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 2 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ "....."	.08	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 2 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 7 in....."	.03	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 7 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 7 in....."	.02	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.03	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ inch....."	.05	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ "....."	.04	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 3 in....."	.03	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 3 in....."	.02	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01
1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 2 in....."	.01	1 $\frac{1}{4}$ x 1 $\frac{1}{2}$ to 8 in....."	.01

% to 2 inches by 1 $\frac{1}{2}$ to 2 inches.....extra, \$.....	Per lb.
1 $\frac{1}{4}$ to 2 "....."	.01
1 $\frac{1}{4}$ to 1 $\frac{1}{2}$ "....."	.01
1 $\frac{1}{4}$ to 1 $\frac{1}{2}$ "....."	.01
2 $\frac{1}{4}$ to 3 "....."	.01
2 $\frac{1}{4}$ to 3 "....."	.01
3 $\frac{1}{4}$ to 4 "....."	.01
3 $\frac{1}{4}$ to 4 "....."	.02
4 $\frac{1}{4}$ to 5 "....."	.02
4 $\frac{1}{4}$ to 5 "....."	.02
5 $\frac{1}{4}$ to 6 "....."	.02
6 $\frac{1}{4}$ to 7 "....."	.03
6 $\frac{1}{4}$ to 8 "....."	.03

Unenumerated sizes at price of the next larger on the list.

CUTTING TO SPECIFIED SINGLE AND MULTIPLE LENGTHS.

24 inches or over.....per lb.,	1 $\frac{1}{2}$ c
18 to 24 inches....."	1c
12 to 18 "....."	1 $\frac{1}{2}$ c
6 to 12 "....."	2c

Less than 6 inches, contract.

SPRING CLASSIFICATION

ROUND AND SQUARE

% to 1 $\frac{1}{2}$ inches.....Base	Per lb.
1 $\frac{1}{8}$ and 1 $\frac{1}{2}$ inch.....extra, 1 $\frac{1}{2}$ c	
1 $\frac{1}{8}$ " 3 $\frac{1}{8}$ "....."	1 $\frac{1}{2}$ c
1 $\frac{1}{8}$ inch....."	1 c
1 $\frac{1}{4}$ "....."	1 $\frac{1}{2}$ c
1 $\frac{1}{2}$ "....."	3 c

Cutting to lengths 24 inches and over, 1 $\frac{1}{2}$ c per lb.; under 24 inches, special price.

FLAT

1 $\frac{1}{4}$ to 4 in.xNo. 4 gauge to 1 $\frac{1}{2}$ in., inclusive.....Base	Per lb.
1 and 1 $\frac{1}{2}$ in.xNo. 1 to 4 gauge.....extra, per lb.,	1 $\frac{1}{2}$ c
1 to 3 " x " 5 " 7 "....."	1 $\frac{1}{2}$ c
3 $\frac{1}{4}$ and 1 $\frac{1}{2}$ " x " 1 " 7 "....."	1 c
3 $\frac{1}{4}$ to 1 $\frac{1}{2}$ " x " 1 " 7 "....."	1 c
3 $\frac{1}{4}$ " 3 " x " 8 " 10 "....."	1 c
3 $\frac{1}{4}$ " 3 " x " 11 " 16 "....."	1 $\frac{1}{2}$ c
3 $\frac{1}{4}$ " 3 " x " 17 " 19 "....."	2 c
3 $\frac{1}{4}$ " 3 $\frac{1}{4}$ " x " 10 " 16 "....."	4 c
3 $\frac{1}{4}$ " 3 $\frac{1}{4}$ " x " 17 " 19 "....."	5 c

GOLD MEDAL MUSIC WIRE

Special Temper for Springs and Brick Cutting. The Very Highest Grade of Spring Wire Obtainable.



Packed in one-lb. packages. Four coils in a package.

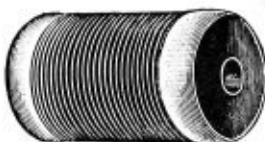
Gauge No.	Size in Decimals of an Inch New A. S. & W. Music Wire Gauge, Brown & Sharpe, Washburn & Moen Standard	Price per Pound
6.0	.004	.....
5.0	.005	.....
4.0	.006	.....
3.0	.007	.....
2.0	.008	\$8.50
1.0	.009	7.00
1	.010	5.50
2	.011	4.00
3	.012	3.00
4	.013	2.75
5	.014	2.50
6	.016	2.00
7	.018	1.50
8	.020	1.25
9	.022	1.25
10	.024	1.00
11	.026	1.00
12	.029	1.00
13	.031	1.00
14	.033	1.00
15	.035	1.00
16	.037	1.00
17	.039	1.00
18	.041	1.00
19	.043	1.00
20	.045	1.00
21	.047	1.00
22	.049	1.00
23	.051	1.00
24	.055	1.00
25	.059	1.00
26	.063	1.00
27	.067	1.00
28	.071	1.00
29	.075	1.00
30	.080	1.00
31	.085	1.00
32	.090	1.00
33	.095	1.00

WIRE ON SPOOLS

Soft Copper, Brass and Iron, Spring Brass, German Silver or Phosphor Bronze Wire.

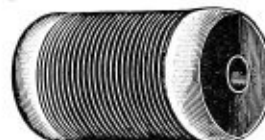
Put up on half-pound spools.

SOFT WIRE



Gauge	SOFT COPPER WIRE		SOFT BRASS WIRE		ANNEALED OR SOFT STEEL WIRE	
	Per Spool	Per Dozen Spools	Per Spool	Per Dozen Spools	Per Spool	Per Dozen Spools
18	\$0.40	\$3.90	\$0.40	\$3.90	\$0.15	\$1.64
20	.40	3.90	.40	3.90	.17	1.68
24	.45	4.70	.45	4.70	.20	1.94
26	.50	4.90	.50	4.90	.23	2.04
28	.60	6.12	.60	6.12	.23	2.13
30	.75	7.44	.75	7.44	.23	2.35

SPRING WIRE



Gauge	BRASS		GERMAN SILVER		PHOSPHOR BRONZE	
	Per Spool	Per Dozen Spools	Per Spool	Per Dozen Spools	Per Spool	Per Dozen Spools
16	\$0.40	\$ 3.90	\$0.77	\$ 7.70	\$0.77	\$ 7.70
18	.40	3.90	.78	7.80	.78	7.80
20	.40	3.90	.80	8.10	.80	8.10
24	.45	4.70	1.05	10.40	1.00	9.90
26	.50	4.90	1.10	10.80	1.05	10.40
28	.60	6.12	1.35	13.60	1.30	12.95
30	.75	7.44	1.60	15.90	1.50	14.95
32	.85	8.76	.....	.....	.....	.....
36	1.80	18.00	.....	.....	.....	.....

WIRE IN COILS

BESSEMER SPRING—MARKET—STONE WIRE—SOFT AND SPRING BRASS AND COPPER WIRE

Bessemer Spring Wire is suitable for all purposes where a special temper is not required.

Market Wire is a soft wire, suitable for all ordinary manufacturing purposes where a spring wire is not needed; it will twist, swage, crimp, etc., and is furnished in annealed, bright, galvanized, coppered or tinned finish, in sizes larger than No. 18 only. The standard bundle is 63 pounds.

Stone Wire is the same in quality and construction as market wire, but is furnished in sizes No. 16 and smaller only. It is called stone wire because it is put up in small coils, weighing one stone (twelve pounds).

A. S. & W. or Washburn & Moen Gauge, Standard					Browne & Sharpe Gauge, Standard		
Gauge	BESSEMER STEEL SPRING WIRE	MARKET WIRE	STONE WIRE		Spring Brass Wire	Soft Brass Wire	Copper Wire
		Advances Over Base	List Prices				
	Coppered	Per 100 Lbs.	Black	Tinned			
1	.05	.05	...	....	...	...	...
2	.05	.05	...	....	...	...	...
3	.05	.05	...	....	...	...	...
4	.05	.05	...	....	...	...	...
5	.05	.05	...	....	...	...	...
6	Base	Base	...	....	...	...	...
7	Base	Base	...	....	...	...	...
8	Base	Base	...	....	.25	.27	.28
10	.10	.05	...	....	.25	.27	.28
12	.30	.15	...	....	.25½	.27½	.28½
14	.60	.35	...	....	.25½	.27½	.28½
16	1.10	.55	.14	.17½	.25½	.27½	.28½
18	1.60	...	.16	.18½	.26	.28	.32
20	2.40	...	.20	.19	.27	.29	.33
..	Above is the	...	...	...	...	...	...
22	advance	...	.22	.20	.29	.31	.35
..	over base	...	...	...	...	...	...
24	per 100 lbs.	...	.24	.21	.32	.34	.38

Always state in ordering brass wire whether soft brass or spring brass is wanted. Flat, square, half round and fancy wire, also wire cut to lengths, subject to special prices.

GALVANIZED WIRE CLOTH

Made from the best steel wire, thoroughly galvanized, has two wires in the selvage, is uniform in mesh and smoothness.

Used extensively in fruit evaporating, belts in drying machines, fire-proof construction, or for any purpose where a rust-proof cloth is required. It is galvanized after woven, which solders each joint and prevents spreading of the wires when cloth is in use.

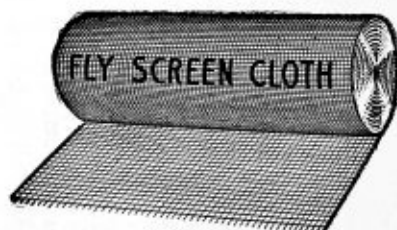
Galvanized before woven cloth is made from the best grade of galvanized wire. Furnished in all the different meshes and sizes of wire shown in list of steel wire cloth on page .

Put up in rolls 100 feet long.

Galvanized cloth takes same list as steel wire cloth

WINDOW SCREEN CLOTH

Made from the best grade of steel galvanized and bronze wire. True to gauge, is double selvage with two wires in each selvage.



Mesh	Stock Sizes	Price per Sq. Ft.
Standard	18-20-22-24-26-28-30-32-36-40-48	\$0.06
14	24-26-28-30-32-36-42-48	.07
16	24-30-36	.08
18	24-26-28-30-32-36	.09
20	24-30-36	.10

STANDARD LIST OF ALL GRADES OF STEEL WIRE CLOTH

IN ROLLS 100 FEET LONG

In ordering Wire Cloth always specify the mesh, size of wire, width and quantity desired.

Mesh—The number of openings per lineal inch, center to center of wire.

Space—The actual opening between the wires.

Gauge—The Washburn & Moen gauge has been adopted as standard for iron or steel wire cloth, and Old English gauge for brass, copper and bronze wire cloth.

Full Rolls—Full rolls contain 100 lineal feet. Cloth cut from rolls cannot be returned.

Stock Widths—Are 24, 30, 36, 42 and 48 inches.

Mesh	No. of Wire	Size of Opening	Price per Sq. Foot	Mesh	No. of Wire	Size of Opening	Price per Sq. Foot	Mesh	No. of Wire	Size of Opening	Price per Sq. Foot
1	4	.775	\$0.73	7	20	.108	\$0.22	18	28	.0395	\$0.22
1	6	.808	.48	7	22	.115	.14	18	30	.0415	.15
1	8	.838	.32	8	16	.062	.60	20	24	.027	.62
2	8	.338	.60	8	18	.078	.38	20	26	.032	.43
2	10	.365	.38	8	20	.090	.27	20	28	.034	.27
2	12	.395	.27	8	22	.097	.17	20	30	.036	.20
2	14	.420	.17	10	18	.053	.60	22	26	.027	.55
2½	12	.295	.32	10	20	.065	.38	22	28	.028	.38
2½	14	.320	.22	10	22	.072	.27	22	30	.031	.26
2½	16	.337	.14	10	24	.077	.17	22	32	.032	.19
3	10	.198	.60	12	20	.048	.48	24	26	.023	.65
3	12	.228	.38	12	22	.055	.32	24	28	.025	.46
3	14	.253	.27	12	24	.060	.22	24	30	.027	.30
3	16	.270	.17	12	26	.065	.14	24	32	.028	.22
4	12	.145	.60	14	20	.036	.60	30	28	.0173	.66
4	14	.170	.38	14	22	.043	.38	30	30	.0193	.47
4	16	.187	.27	14	24	.048	.27	30	32	.0203	.31
4	18	.203	.17	14	26	.053	.17	40	32	.012	.57
6	14	.087	.60	16	22	.034	.60	40	34	.015	.44
6	16	.104	.38	16	24	.040	.38	50	34	.....	.80
6	18	.120	.27	16	26	.0445	.27	50	36	.....	.60
6	20	.132	.17	16	28	.0465	.17	60	36	.....	.85
7	16	.080	.48	18	24	.032	.48	70	38	.....	.90
7	18	.096	.32	18	26	.037	.32	80	40	.....	1.20

Our steel wire cloth is made from wire of unusual toughness, true to gauge. We furnish it for all purposes and in all grades such as light Hardware and Fanning Mill grade, Hardware grade, Riddle and Heavy Riddle grades, Foundry, Heavy Foundry and Extra Heavy Foundry grades, Machinery grade, Mining Cloth, etc., also different meshes and wires expressly designed to meet special requirements. We are prepared to give most prompt attention to all orders and inquiries for these goods.

STANDARD PRICE LIST OF ALL GRADES OF BRASS AND COPPER WIRE CLOTH

IN FULL ROLLS, 100 FEET LONG

OLD ENGLISH GAUGE STANDARD

In addition to the meshes listed below, we are prepared to furnish a large line of special meshes and wires, prices for which will be furnished on application.

Mesh	No. of Wire	Size of Opening	Price per Sq. Foot	Mesh	No. of Wire	Size of Opening	Price per Sq. Foot	Mesh	No. of Wire	Size of Opening	Price per Sq. Foot
2	10	.366	\$2.00	8	24	.109	\$0.40	22	34	.....	\$0.27
2	12	.391	1.75	10	18	.051	2.50	24	26	.....	1.50
2	14	.417	.85	10	20	.065	1.20	24	28	.....	.80
2	16	.435	.50	10	22	.071	.60	24	32	.....	.40
3	12	.224	2.50	10	24	.075	.45	26	28	.....	1.10
3	14	.250	1.20	12	20	.048	1.75	26	30	.....	.60
3	16	.268	.60	12	22	.054	.85	26	34	.....	.35
3	18	.284	.45	12	24	.058	.50	28	28	.....	1.13
4	12	.141	3.00	12	26	.063	.40	28	30	.....	.63
4	14	.167	1.75	14	22	.042	1.20	28	32	.....	.46
4	16	.185	.85	14	24	.046	.60	28	34	.....	.36
4	18	.201	.60	14	26	.....	.45	30	28	.....	1.15
5	12	.105	3.00	14	28	.....	.35	30	30	.....	.65
5	14	.117	2.50	16	22	.....	1.50	35	30	.....	.85
5	16	.135	1.20	16	24	.....	.80	35	32	.....	.55
5	18	.151	.60	16	26	.....	.40	40	32	.....	.70
5	20	.165	.45	18	24	.....	1.10	40	36	.....	.42
6	14	.082	3.00	18	26	.....	.60	45	34	.....	.58
6	16	.102	1.75	18	28	.....	.45	50	34	.....	.75
6	18	.118	.85	20	24	.....	1.50	60	36	.....	.60
6	20	.132	.50	20	26	.....	.80	70	37	.....	.70
8	16	.060	3.00	20	30	.....	.40	80	38	.....	.90
8	18	.076	1.75	20	34	.....	.25	90	39	.....	1.10
8	20	.090	.85	22	26	.....	1.10	100	40	.....	1.20
8	22	.095	.50	22	30	.....	.45				

Only the best low brass and pure copper wire is used in the manufacture of this cloth. We can furnish promptly from stock all regular grades and sizes; also all kinds of twilled cloth for filters, ventilator or car cloth, cloth for sugar machines, etc.

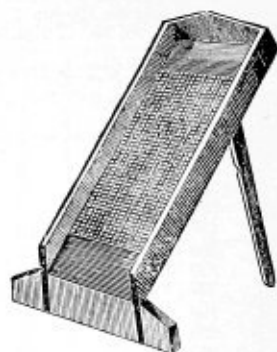
ECLIPSE STEEL WIRE SCREENS

For Screening Coal, Coke, Sand, Gravel, Etc.

Made of superior quality steel wire carefully drawn and tempered. Cloth or bottom is extra heavy double crimped wire. Frames are thoroughly seasoned oak, securely fastened together and strongly ironed. All metal japanned to prevent rusting. Leg is thoroughly braced and screen is adjustable to any height required.



PLAIN SCREEN
Nos. 10 and 20



WITH FOOTBOARD AND LEG
Nos. 1 and 2

Number	Style	Dimensions, inches	Approximate Weight, Pounds	Price Each
10	Extra	34x76	101	\$15.00
20	Regular	31x69	86	12.00
1	Extra	34x81	118	17.25
2	Regular	31x74	106	14.25

In ordering, do not fail to mention the size mesh (hole) wanted. All meshes are furnished at same price.

STANDARD COAL SCREENS

Steel Wire, Double Crimped, Japanned



Frames made of well seasoned oak; Screen is steel wire, double crimped japanned.

Dimensions, inches	Approximate Weight, Pounds	Price Each
29x71	70	\$7.50

Any mesh furnished.

Always state, in ordering, what mesh is wanted. Furnished with frame bolted together, extra each, \$1.00

HANDY SCREENS

Steel Wire—Japanned or Galvanized



Spruce frames, medium grade steel wire cloth single crimped. Frames strongly fastened together and braced with sheet iron.

No.	Kind of Wire	Approximate Weight, Pounds	Size inches	Price Each
6	Japanned	33	25x62	\$6.00
7	"	37	28x66	7.50
9	Galvanized	33	25x62	7.50
10	"	37	28x66	9.00

Stock meshes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1".
Always state mesh wanted.

CAR AND YARD SCREENS



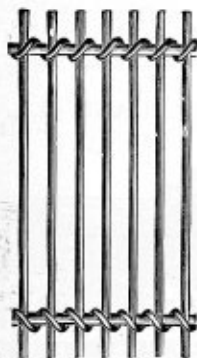
In Position For Car Use

A combined Car and Yard Screen, light in weight, and of most substantial construction. Has hardwood frame, securely fastened together and thoroughly reinforced with sheet iron. Screen is best quality steel wire cloth, double crimped and can be furnished in all meshes from $\frac{1}{4}$ in. to 2 in. ($\frac{1}{2}$ in. recommended for general use).

No.	Size, inches	Style	Approx. weight	Price Each
*24	24x57	Car use only	60	\$13.50
25	24x57	Car or yard use	75	14.25

*Price is for screen without head board or foot board, but with clamps for use on cars only.
Always state mesh wanted.

SAND SCREENS



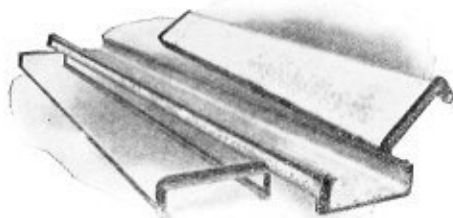
Detail of Construction

Has well seasoned Spruce frame securely fastened together. The spiral coiled steel wire construction (shown in cut) of screen permits the use of extra heavy wires; a uniform mesh is obtained and the heavy spiral withstands wear caused by constant contact with sand.

Size	Dimensions, inches	Space between wires	Weight, pounds	Price Each
Small	22x60	$\frac{1}{2}$	23	\$5.25
Large	26x86	$\frac{1}{2}$	40	6.76

ANGLE EXTENSION WAGON CHUTES

For Hard and Soft Coal



Body of chute is made of sheet steel, black or galvanized. Frame designed to strengthen it is made of angle iron excepting the plain band riveted to foot of frame. The heavy angle end band riveted to top end not only strengthens frame, but makes an in-structive wagon catch. Sides and end of chute are riveted to this frame making a chute that is very strong and durable.



The chutes are adapted to indefinite extension and will chute coal any distance. Each section is an independent chute which may be used for sized coal, lump coal or wood. Made of No. 18 black sheet steel with heavy end bands.

Length, feet	Approximate weight per foot	Price, Black	Price, Galvanized
5	6	\$ 5.00	\$ 6.00
6	6	6.00	7.20
8	6	8.00	9.60
10	6	10.00	12.00
12	6	12.00	14.40

Black Iron always furnished unless otherwise ordered.

TELESCOPE WAGON CHUTES

For Hard Coal



Made of No. 18 black sheet steel; strongly reinforced by angle irons and end bands, same as the extension. Top end 22 inches wide, extension end 12 inches wide.

Closed length, feet	Slide, feet	Approx. weight per foot	Available length, feet	PRICE EACH	
				Black	Galvanized
8	6	6	12	\$16.20	\$19.44
10	8	6	16	21.60	25.92
12	10	6	20	27.00	32.40

RAILROAD FUSEES AND TORPEDOES



For preventing rear end collisions. Will not break when thrown from train. Not affected by wind, snow or rain. Displays a brilliant light for 5 to 10 minutes.

Furnished any color desired, with wood or iron base or wood handles.

Weight per Case, Lbs.

No.	Inside Diam.	10 MINUTE		5 MINUTE		
		Iron Base	Wood Base	Iron Base	Wood Base	Wood Handle
1	1 1/8	165	110	.....	.....	90
2	1 3/8	120	90	70	50	.....
3	1 1/2	85	65	55	40	.....

Packed one gross in a case.

Combination Fusees

Burns first 5 minutes red, giving a danger signal, and the next 5 minutes green or yellow, giving a cautionary signal.

With iron base.....\$..... per gross

Weight 120 lbs. per gross case.

Torpedoes



The cut above is our No. 5 Bull's-Eye or Round Wedge Torpedo with lead strap.

5 gross in a case, w't 60 lbs.....per gross, \$3.00

No. 5 with spring strap....." 8.00

No. 4. Wedge shaped lead strap torpedo,

5 gross in case, w't 80 lbs.....per gross, 3.00

No. 3. Steel spring torpedo for use with

torpedo dropper, w't 5 gross case 50 lbs.

per gross.....7.00

No. 0. Lead strap torpedo. Has square

top and is most commonly used, w't 5

gross case 50 lbs.....per gross, 2.00

Torpedo Dropper

For placing torpedoes.....each, \$

GUMBO PIPE CEMENT

For All Steam, Gas, Water, Brine and Ammonia Joints



Has been in use for 12 years by the leading GAS COMPANIES and PLUMBERS of the United States and Canada. The constantly increasing demand for it is a guaranty of its qualities. It is a known and tried success.

Does not rust or corrode; fitted joints can be easily taken apart; prolongs the life of rubber or other gaskets; is cheaper than lead, because it weighs less and goes three times as far; is not so wasteful as lead, because it is dry, and you mix it as you need it; will stand any amount of pressure, and makes an absolutely tight joint.

2 lb. packages.....	\$0.25
4 lb. packages.....	.50
8 lb. packages.....	1.00
25 lb. packages.....	2.75
50 lb. packages.....	5.25
Half bbls.....per lb.,	.10
Full bbls.....	.10

Mix Cement rather thickly with Boiled Linseed Oil, apply to the threads of pipes, like Red or White Lead, and screw up tight. It will harden in from four to six days.

For Flange Joints, place thin layer each side of Gasket and screw up tight.

For Quick Setting Work, mix with common varnish.

For Ammonia and Brine Joints, mix with common varnish.

For Leaks in Wash Bowls, Broken Closet Horns, Bowls, etc., mix with varnish, apply to cracks, let set hard before turning on the water, etc.

For General Pipe Joints (hot and cold water Galvanized Piping), Gas Fitting and steam work, use Boiled Linseed Oil or Varnish.

"EVERY CAN GUARANTEED."

METAL POLISH AND CLEANER



Instantly produces the most brilliant polish on any kind of finished metal surfaces, and is a universal cleaner for floors, wood work, furniture, carpets, etc. Can be used as a soap and washing compound. Will not injure anything.

6 ounces.....per dozen, \$1.20

10 "....." 1.60

Quart....." 2.70

Gallon....." 9.00



Stitched Canvas Belt



White Cotton Belt



Concentrator Belt



Rubber Belting



Conveyor Belt



Endless Thresher Belt



Reinforced Conveyor Belt



Leather Belt

Rubber Belting

The adhesiveness of rubber belting, as well as tensile strength and even surface, make it the best material devised for power transmission. It is the cheapest in both initial and actual cost, and as a transmitter of power, is easiest to care for. In damp places or when subjected to the changes of weather, it is especially serviceable.



The good points of a belt are not always apparent in a sample. The wear is the only real test. All our belts are made with the greatest care. We carry several grades, but always recommend the best as being the cheapest in the end and far more satisfactory to the user.

Tensile Strength

The strength of rubber belting depends primarily upon the weight and construction of the duck of which it is made. The tensile strength of a high grade belt made four-ply may generally be figured at 1000 lbs. per inch of width.

Our Brands

In the selection of rubber belting, it is advisable to use well-known brands which have a reputation gained through actual service. Our different grades offer a wide enough range in quality and price to fill the requirements of any case.

"Bullock"

Our "Bullock" belt is made of extra heavy belting duck, woven from long staple cotton, made for this especial purpose. The most adhesive rubber is used between the plies. Except where the work is extraordinarily heavy, or where nothing but a specially constructed belt can be used to advantage, we recommend and guarantee our "Bullock" in every way.

"Castor"

"Castor" is made from selected rubber and best quality cotton duck. Although somewhat lighter in weight than "Bullock," the workmanship is equal in every way. It is a belt that will prove especially satisfactory in light saw-mill work, for carriers, or any place where the work required of it is not unreasonably heavy.

"President"

Our "President" is a special grade, which we furnish to order only; stitched or unstitched, as desired. Made of extra heavy duck and best Para friction. It will give best results under the hardest strain, and is recommended for use in paper mills and saw mills, or wherever the work is especially heavy.

Regular Rubber Belt List

From which we allow different discounts, depending upon the grade.

	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot
Width, Inches	2-PLY	3-PLY	4-PLY	5-PLY	6-PLY	7-PLY	8-PLY
1	\$ 07	\$ 09	\$ 11	....	....	....	....
1 1/4	09	11	13	....	....	....	....
1 1/2	11	13	15	\$ 19	....	....	....
1 3/4	13	15	17	21	....	....	....
2	15	17	21	25	\$ 31	....	....
2 1/2	18	22	26	32	39	....	....
3	22	26	31	38	46	....	....
3 1/2	26	30	37	46	55	....	....
4	30	34	42	52	63	\$ 73	....
4 1/2	33	39	47	58	70	82	....
5	36	43	52	65	78	91	....
6	43	52	62	77	93	1 08	\$ 1 24
7	51	60	73	91	1 09	1 27	1 46
8	59	70	84	1 05	1 26	1 47	1 68
9	67	80	95	1 18	1 42	1 66	1 90
10	75	90	1 07	1 33	1 60	1 87	2 14
11	83	1 00	1 18	1 47	1 77	2 06	2 36
12	91	1 08	1 30	1 62	1 95	2 27	2 60
13	1 00	1 18	1 42	1 77	2 13	2 48	2 84
14	1 08	1 28	1 54	1 92	2 31	2 69	3 08
15	1 16	1 38	1 66	2 07	2 49	2 90	3 32
16	1 25	1 50	1 78	2 22	2 67	3 11	3 56
18	1 41	1 70	2 02	2 52	3 03	3 53	4 04
20	1 58	1 90	2 26	2 82	3 39	3 95	4 52
22	1 76	2 12	2 52	3 15	3 78	4 41	5 04
24	1 96	2 36	2 80	3 50	4 20	4 90	5 60
26	2 16	2 60	3 08	3 85	4 62	5 39	6 16
28	2 36	2 84	3 36	4 20	5 04	5 88	6 72
30	2 55	3 10	3 64	4 55	5 46	6 37	7 28
32	2 75	3 35	3 92	4 90	5 88	6 86	7 84
34	2 95	3 60	4 20	5 25	6 30	7 35	8 40
36	3 15	3 85	4 48	5 60	6 72	7 84	8 96
38	3 35	4 10	4 76	5 95	7 14	8 33	9 52
40	3 55	4 35	5 04	6 30	7 56	8 82	10 08
42	3 75	4 60	5 32	6 65	7 98	9 31	10 64
44	3 95	4 85	5 60	7 00	8 40	9 80	11 20
46	4 15	5 10	5 88	7 35	8 82	10 29	11 76
48	4 35	5 35	6 16	7 70	9 24	10 78	12 32
50	....	....	6 44	8 05	9 66	11 27	12 88
52	....	....	6 72	8 40	10 08	11 76	13 44
54	....	....	7 00	8 75	10 50	12 25	14 00
56	....	....	7 28	9 10	10 92	12 74	14 56
58	....	....	7 56	9 45	11 34	13 23	15 12
60	....	....	7 84	9 80	11 76	13 72	15 68

In this catalog we have endeavored to place our line of Rubber Goods, Belting, Packing, Hose, etc., before our customers and other users of such goods, in as comprehensive and brief a manner as possible.

We are manufacturers and distributors of Machinery and Supplies for Steam Railroads, Electric Railroads, Contractors, Bridge Builders, Stone Quarries, Mines, Blacksmiths, Saw Mills, Paper Mills, Flour Mills, Cotton Mills, Elevators, Electric Light Plants, Coal Dealers, Factories and Machine Shops.

Reinforced Conveyor Belt

Rubber Covered

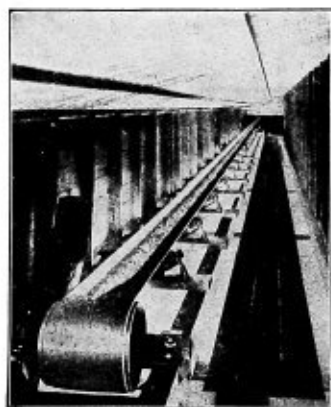


Conveyor Belt is now being extensively used by mines, mills and factories of every kind. It facilitates the movement of material from one part of the plant to another and entirely does away with the slower and more expensive operation of trucking or carrying by hand.

Wet or dry, hot or cold materials of almost any size or weight can be easily and quickly elevated on an incline or carried horizontally.

Conveyor Belt can be adapted to any kind of service; the material can be fed upon it by hand or by dredges, bins, chutes, crushers or rolls, and delivered into pockets, bins, wagons or cars.

Channon's Special Reinforced Conveyor Belt is specially constructed for carrying or elevating materials of a rough, abrasive nature, such as ore, coal, coke, crushed stone, sand, gravel, cement, concrete, wood pulp, grain, etc. Only the best materials are used in the manufacture of this belt and the carrying surface is reinforced by a cover, made of the very best rubber compound, varying from $\frac{3}{16}$ inch to $\frac{1}{4}$ inch in thickness, according to the class of work required.



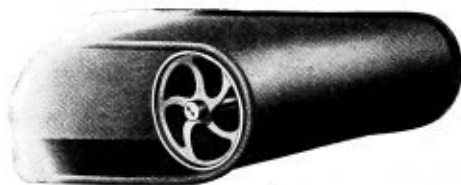
Conveying Grain

The center or carrying part of the belt can be specially reinforced by an extra thickness of rubber as illustrated in the sectional cut at the top of the page. This puts the strength where the greatest amount of wear and strain occurs.



Conveying Ore

Concentrator Belt



Our Concentrator Belt shows in its construction, a thorough recognition of the peculiar requirements of the service for which it is intended and the correct methods of providing for them.

One of the special points of our Concentrator Belt is the peculiar shape of the flange, which has a tendency to fold inward toward the face of the belt in passing over the rollers of the machine. This reduces the strain on the upper edge of the flange, where it has the greatest tendency for the rubber to crack and at the same time prevents the material from dropping over the side of the belt, as is frequently the case where flanges bend outward in passing over end rollers.

The flanges and faces of these belts are made of special compositions that insure the best wear and longest service.

We can make Concentrator Belts with either plain or corrugated surfaces. Prices quoted on application.

Leather Belting

Champion

Harrison

Extra Standard



"Champion"

Strictly Short Lap

This is a superior short lap belt made of carefully selected and well matched pieces cut from extra heavy packer hides. Only the central portion, the very best of this extra heavy hide, is used. Thus is obtained a uniform thickness in the leather, which gives great strength and insures smooth running. We recommend our "Champion" belt for factory use, saw mills, rolling mills, wood working machinery or wherever belt is given the hardest service. Made in all widths, both single and double.

"Harrison"

Extra Short Lap

This belt is made in both single and double up to 12 inches in width of the same quality of stock as our "Champion," but it is a trifle lighter in weight. It has the requisite strength and will give excellent service.

"Extra Standard"

This is a strictly short lap belt, made from the same tannage as our better grades, but lighter in weight. Made up to 8 inches in width, and is guaranteed for ordinary work, such as machine shop use or slow running machinery.

Rawhide Leather Belting

For some uses rawhide belt is better than tanned leather or rubber belt. It excels for high speed on small pulleys. It is made with strictly short laps, sewed or riveted, as desired.

For factories or shops, like printing establishments, laundries, etc., where light and cleanliness are desired, rawhide belting is very desirable and unsurpassed. Furnished in our Champion grade only.

For list prices, use the regular leather belt list.

Anhydrous Belting

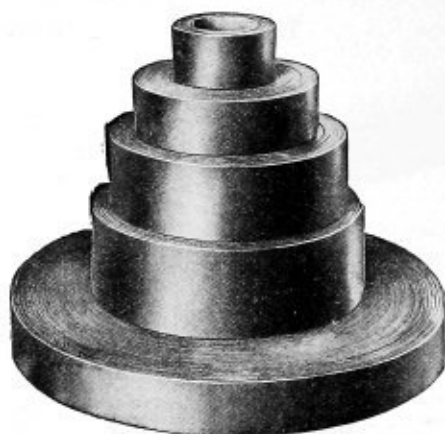
A Mineral Tanned Belt, Green in Color

Anhydrous belting is especially serviceable for use in damp and steamy places. It is very soft and will not harden and crack after being wet. It is a good belt for all around work.

Use regular leather belt list.

Price List of Leather Belting on Next Page.

Leather Belting—(Continued)



Special Leather Belting

Creamery Belting

For the creamery supply trade we make a special single belt from selected stock, oil dressed with stitched laps. Belting made in this way seems to withstand the action of moisture and the rapid motion incident to its use in creameries better than belting finished in any other way.

Dynamo Belting

The production of our Dynamo brand of leather belting is the result of careful study of the requirements of the different machines used under all conditions and in all climates.

When ordering Dynamo Belting, always state the system used.

Dynamo belts should always be made endless, and if this work cannot be done in our factory, which we prefer, we prepare the ends for splicing and send cement necessary for making the belt endless on the pulley.

Price List of Leather Belting

Width, inches	PRICE PER FOOT		Width, inches	PRICE PER FOOT		Width, inches	PRICE PER FOOT		Width, inches	PRICE PER FOOT	
	Single	Double		Single	Double		Single	Double		Single	Double
$\frac{1}{2}$	\$0.12	\$0.24	4	\$0.96	\$1.92	17	\$4.08	\$ 8.16	36	\$ 8.64	\$17.28
$\frac{3}{8}$	.15	.30	4½	1.08	2.16	18	4.32	8.64	38	9.12	18.24
$\frac{1}{2}$	.18	.36	5	1.20	2.40	19	4.56	9.12	40	9.60	19.20
$\frac{3}{4}$	.21	.42	5½	1.32	2.64	20	4.80	9.60	42	10.08	20.16
1	.24	.48	6	1.44	2.88	21	5.04	10.08	44	10.56	21.12
1¼	.30	.60	6½	1.56	3.12	22	5.28	10.56	46	11.04	22.08
1½	.36	.72	7	1.68	3.36	23	5.52	11.04	48	11.52	23.04
1¾	.42	.84	8	1.92	3.84	24	5.76	11.52	50	12.00	24.00
2	.48	.96	9	2.16	4.32	25	6.00	12.00	52	12.48	24.96
2¼	.54	1.08	10	2.40	4.80	26	6.24	12.48	54	12.96	25.92
2½	.60	1.20	11	2.64	5.28	27	6.48	12.96	56	13.44	26.88
2¾	.66	1.32	12	2.88	5.76	28	6.72	13.44	58	14.40	28.80
3	.72	1.44	13	3.12	6.24	29	6.96	13.92	60	15.36	30.72
3¼	.78	1.56	14	3.36	6.72	30	7.20	14.40	62	16.32	32.64
3½	.84	1.68	15	3.60	7.20	32	7.68	15.36	64	17.28	34.56
3¾	.90	1.80	16	3.84	7.68	34	8.16	16.32			

Canvas Belting

**Gandy
Canvas Belting**
Painted Red

This belt is similar in construction and appearance to our Boughton brand cotton belting and takes the same list prices.

**Boughton Endless Thresher
Belts**

These belts are carried in stock in all regular sizes and lengths.

Special lengths, extra heavy thickness, or narrow belts, can be made to order on short notice.



Canvas and Cotton Belting



Stitched Canvas Belt



White Woven Cotton Belt

Boughton Stitched Canvas Belt

Gandy Style—Painted Red

Boughton stitched canvas belt will run true—will not harden in cold weather, nor will it freeze in zero weather. Especially adapted for any place where the belt is subjected to varying temperatures, or where it will receive hard usage.

Made in one piece, however long, consequently even in strength and thickness.

Use 8-ply in place of double leather or 5- and 6-ply rubber, 6-ply in place of light double leather or 4-ply rubber, 4-ply in place of single leather or 3-ply rubber, and 10-ply where extraordinary strength is required.

Victor White Woven Cotton Belt

Not Painted

Victor White Woven Cotton Belt is made by weaving several layers in one solid body. This belt partakes of the strain in all its parts equally in passing the pulley. The cost is much less than rubber or leather belting.

Boughton Stitched Canvas Belt—Price Per Foot

Width, inches	4-Ply	6-Ply	8-Ply	10-Ply	Width, inches	4-Ply	6-Ply	8-Ply	10-Ply
1½	\$0.15	.....	.....	.....	14	\$1.47	\$2.12	\$2.79	\$3.45
2	.20	.....	.....	.....	16	1.68	2.44	3.19	3.95
2½	.25	.....	.....	.....	18	1.89	2.74	3.59	4.44
3	.30	\$0.44	.....	.....	20	.....	3.05	3.99	4.94
3½	.35	.51	.....	.....	22	.....	3.35	4.39	5.43
4	.40	.58	\$0.76	.....	24	.....	3.65	4.79	5.92
4½	.45	.65	.....	.....	26	.....	4.15	5.43	6.72
5	.50	.73	.85	.....	28	.....	4.47	5.85	7.24
5½	.60	.87	1.14	.....	30	.....	4.79	6.27	7.76
6	.70	1.02	1.32	.....	32	.....	.....	6.69	8.27
7	.80	1.16	1.52	.....	36	.....	.....	7.52	9.31
8	.90	1.31	1.71	.....	40	.....	.....	8.36	10.34
10	1.00	1.45	1.90	.....	48	.....	.....	10.94	13.54
12	1.20	1.74	2.28	\$2.82	54	.....	.....	.....	15.23
13	1.37	1.99	2.60	.....	60	.....	.....	.....	16.92

Victor White Woven Cotton Belt—Price Per Foot

Width, inches	2-Ply, per ft.	3-Ply, per ft.	4-Ply, per ft.	5-Ply, per ft.	6-Ply, per ft.	8-Ply, per ft.	Width, inches	2-Ply, per ft.	3-Ply, per ft.	4-Ply, per ft.	5-Ply, per ft.	6-Ply, per ft.	8-Ply, per ft.
1	\$0.04	.....	.....	.....	.....	.....	10	\$0.26	\$0.39	\$0.50	\$0.63	\$0.75	\$1.15
1½	.05	\$0.06	.....	.....	.....	.....	11	.29	.45	.55	.69	.81	1.25
2	.06	.08	\$0.12	.....	.....	.....	12	.33	.48	.60	.75	.90	1.35
2½	.06½	.10	.14	.....	.....	.....	14	.41	.60	.75	.94	1.12	1.65
3	.07	.12	.16	.....	.....	.....	16	.49	.72	.90	1.12	1.35	1.95
3½	.08	.14	.18	.....	.....	.....	18	.57	.82	1.00	1.28	1.50	2.13
4	.09	.15	.21	\$0.34	.....	.....	20	.64	.90	1.15	1.44	1.72	2.33
4½	.11	.17	.24	.36	.....	.....	22	.65	1.00	1.25	1.62	1.94	2.60
5	.13	.19	.26	.38	.....	.....	24	.69	1.10	1.55	1.80	2.16	2.85
5½	.15	.21	.28	.40	.....	.....	26	.....	.....	1.75	2.00	2.16	3.15
6	.17	.23	.30	.42	\$0.46	\$0.75	28	.....	.....	1.90	2.15	2.60	3.35
7	.19	.27	.34	.45	.51	.78	30	.90	.....	2.10	2.35	2.85	3.60
8	.21	.31	.38	.50	.57	.91	36	.....	.....	2.60	.....	.....	.....
9	.23	.35	.44	.56	.66	1.03	.....	.....	.....	.....	.....	.....	.....

This belt cannot be woven endless. Be careful not to confuse with the painted belting.

NOTE: In cutting holes for lacing do not use a hollow punch, as it will cut the fabric and weaken the belt; always use a pointed instrument and push the fabric apart.

Twisted and Solid Round Leather Belting, Oak Tanned and Rawhide



Diameter, inches	Twisted, Price per Foot	Solid, Price per Foot
1/4	\$0.06	\$0.05
3/8	.10	.07
1/2	.14	.10
5/8	.18	.14
3/4	.22	.18
7/8	.30	...
1	.36	...
1 1/8	.46	...
1 1/4	.60	...
1 1/2	.72	...

Moran's Steel Belt Coupling for Round Belts



Size, inches	Price per Pair	Size, inches	Price per Pair
1/4	\$0.30	1 1/2	\$0.40
3/8	.25	5/8	.60
1/2	.20	3/4	.90
5/8	.25	1 1/8	1.30
3/4	.30	1	1.80
7/8	.35	...	...

Sizes are Outside Diameters.

"Boughton" Belt Dressing



"Boughton" Belt Dressing, an oily product taken from sheep's wool, makes the leather soft, flexible, and impervious to water or steam.

The increased flexibility of the belt renders increased transmission. A preservative of this nature prohibits the possibility of the belt opening at the laps. As a leather preservative there is no equal.

Put up in 1 pound bars.

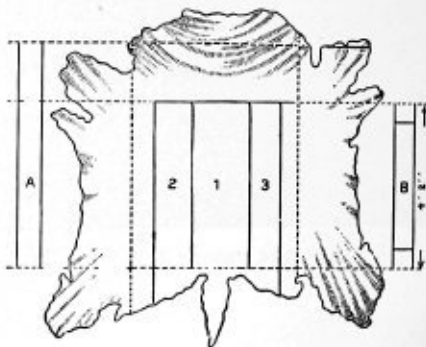


"Boughton" Belt Cement

Put up in perforated cans, which prevents all possibility of molding or decaying.

How Hides Are Cut For Leather Belts

We are showing herewith a diagram of a hide with lines indicating the different qualities of leather taken from a single hide.

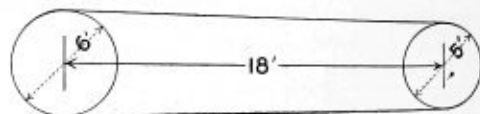


The center (Fig. 1) is heaviest and most uniform. The sides (Fig. 2 and 3) are lighter, but of quality suitable for belting. The rest of the hide is not suitable for belting, and if used for such purposes, will not give good service.

Our "Champion" Leather Belt is cut from Center Stock, Fig. 1.

To Ascertain the Length of a Belt

Where pulleys are of equal size or where they are of somewhat different size and rather far apart:



Add together the pulley diameters, multiply by 1.57 and add twice the center-to-center distance.

EXAMPLE—Dimensions as per sketch above.

$$\begin{aligned}
 6+6 &= 12 & 12 \times 1.57 &= 18.84 \\
 18 \times 2 &= 36 & 18.84 + 36 &= 54.84 \text{ feet} \\
 & & &= 54 \text{ feet } 10 \frac{1}{4} \text{ inches}
 \end{aligned}$$

Where pulleys differ considerably in size or are on short centers, send dimensions to us and we will figure out the proper length.

To Find the Approximate Length of Belt in a Roll

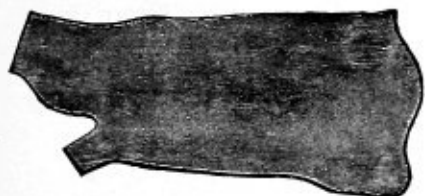
Add to the diameter of the roll in inches the diameter of the center hole, multiply the sum by the number of layers of belt in the roll, and then multiply the result by 0.131. The result will be the length in feet.

EXAMPLE: How many feet of belting in a roll 48 inches high with a center hole 6 inches and with 88 layers in the roll.

$$\begin{aligned}
 48+6 &= 54 & 54 \times 88 &= 4752 \\
 4752 \times 0.131 &= 622.512 \text{ or } 622 \frac{1}{4} \text{ feet}
 \end{aligned}$$

If remembered, this little table might save a few hours labor some time.

Rawhide Lace Leather Champion Brand



This is the best rawhide lace leather that can be purchased. It is made from the best navy green salted hides, and is entirely free from hard spots, about 17 square feet to the side.

Price per square foot on application.

Champion Rawhide Cut Lace Leather



Our Champion Rawhide Lace Leather is the best we can secure; put up in bunches of 100 feet each.

Width, inches	Price Per 100 Feet	Width, inches	Price Per 100 Feet
$\frac{1}{4}$	\$1.25	$\frac{1}{2}$	\$2.25
$\frac{3}{8}$	1.50	$\frac{5}{8}$	3.25
$\frac{1}{2}$	1.75	$\frac{3}{4}$	3.75
$\frac{7}{8}$	2.00		

Boughton Wire Belt Lacing

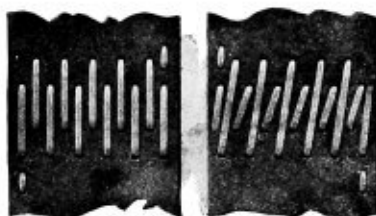


Lace in the same general way as with lace leather, using punch to cut holes and cutting pliers to cut and pull lacing. For friction or for narrow belts, wire lacing is very satisfactory.

Put Up in 50-Foot Coils

No.	For Belts Suitable	Price Per Coil
00	$\frac{1}{2}$ to 1 inch leather	\$0.50
0	$\frac{1}{2}$ to 3 inch leather .....	.50
1	2 to 6 inch leather and 4-ply rubber .....	.60
2	Wide single leather, narrow double leather or 6-ply rubber .....	.75
3	All heavy drive belts.....	1.00

How to Lace Belting With Champion Cut Lace Leather



Pulley-side

Outside

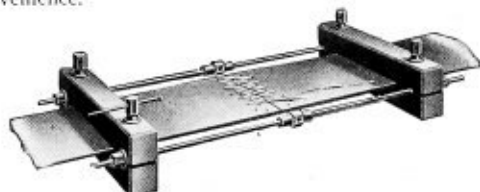
To join with lacing leather, butt the ends together, being careful that the edges are cut exactly at right angles to the belt. Use our Superior Belt Splicing Tool to cut oval holes in belt, making the larger diameter of oval parallel with the sides of the belt. Holes should be punched as nearly as possible according to the following table:

	2 to 6 inches	6 to 12 inches	12 to 18 inches	18 to 24 inches
Distance from edge of belt—				
First row	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
First row	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	1
Second row	$\frac{3}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$
Second row	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Distance apart of each row of holes	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Size of lace leather.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$

Lacing on pulley side of belting should be parallel with the belt. The best method of lacing is as shown in above cuts.

Belt Clamps

The frame is made of hard wood with the jaws corrugated. They are simple and strong, and where there is any need for them they are a great convenience.



For Belt Suitable	Price Each
8 to 12 inch	\$18.00
12 to 16 inch	22.00
16 to 20 inch	26.00
20 to 24 inch	30.00
24 to 30 inch	34.00

Bristol's Steel Belt Lacing

Staggered Point. For All Kinds of Belt.

**Ready to Apply Finished Joint**

No.	For Belt Suitable	Price, Per Box
110	Split Leather and Light Rubber and Cotton Belts.	\$1.00
111	Ordinary Single Leather and 3-ply Rubber and Cotton Belts.	1.50
112	Extra Heavy and Single Leather and 4-ply Rubber and Cotton Belts.	2.00
114	Heavy Double Leather Belts and 6-ply Rubber and Cotton Belts.	3.00
115	Extra Heavy Double Leather, and 7-ply Rubber and Cotton Belts.	3.50
117	8-ply and Extra Double Heavy Rubber and Cotton Belts.	4.95
119	10-ply and Extra Heavy Conveyor Belts.	6.05

For Leather Belt Only

No.	For Belt Suitable	Price, Per Box
0	Light Single	\$1.00
1	Regular Single	1.50
2	Heavy Single	2.00
3	Double	2.50
5	Extra Heavy Double	3.50

Put up in boxes containing 100 inches, assorted lengths, or in boxes containing 50 pieces each of three-point lace. Price on box of 50 pieces on application.

Jones Belt Hooks

Made of Norway Iron

Hook Number	Number in Box	Price, Per 1000
8	500	\$5.00
7	250	6.00
6	250	8.50
5	250	11.00
4	200	14.00
3	200	16.00

Improved Belt Studs

Blake's Pattern



Stud Number	Number in Box	Price, Per Box
3	100	\$0.90
2	100	1.25
1	100	1.65
0	100	2.00
00	100	2.50

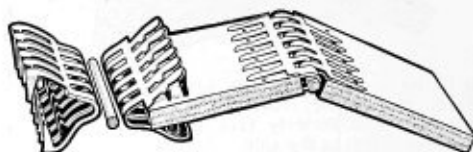
No. 00 is suitable for the heaviest leather belt or 6-ply rubber belt.

Alligator Steel Belt Lacing

Adapted for use on Leather, Rubber, Cotton or Canvas-stitched Belting.

Overcomes the tendency for textile belting to fray at the ends.

No punch holes are necessary—to make a good joint; no tool is required but a hammer.

**Packed in Boxes as Follows:**

Box No.	Lacing No.	Thickness of Belt, inches	Length of Section, inches	Lined inches	Width of Belting It Will Lace, inches	Price per Box
F	25	$\frac{5}{16}$ to $\frac{3}{8}$	8	96	48	\$1.00
G	25	$\frac{5}{16}$ to $\frac{3}{8}$	12	192	96	2.00
M	35	$\frac{3}{8}$ to $\frac{7}{8}$	8	64	32	1.00
N	35	$\frac{3}{8}$ to $\frac{7}{8}$	12	96	48	1.50
U	45	$\frac{3}{8}$ to $\frac{3}{4}$	12	96	48	2.00
X	65	$\frac{7}{8}$ to $1\frac{1}{2}$	12	96	48	2.60

This lacing is connected with rawhide pins, for which a minimum charge is made.

To Increase the Efficiency of a Belt:

The use of small pulleys and narrow thick belts should be avoided. Preference should be given to large pulleys and wide thin belts.

Drive belts should not be run tight, but should be wide enough to run moderately slack without slipping.

Belts should not be adjusted with the pull on the top side; the sag of the slack on the top side will increase the pulley contact.

A rubber belt should not be condemned because it slips. It is probably overloaded.

Pulleys should be at least one-half inch wider, rather than the same width of the belt, to get the maximum power.

The seam side of a rubber belt should never be run next to the pulley.

Animal greases and mineral oils are very injurious to rubber belts and should never be used.

When a rubber belt wears out on the edges, do not condemn it; look the machinery over and find out where the belt strikes when running and remove the obstacle.

Belt Punches

Solid Tool Steel, Drilled and Reamed



No.	Price, Per Dozen	Price, Each
1, 2, 3, 4, 5, 6.....	\$2.00	\$0.20
7, 8, 9.....	2.25	.25
10, 11, 12.....	2.50	.25
13, 14.....	5.00	.50
14—Special.....	5.25	.55

Size of Punches

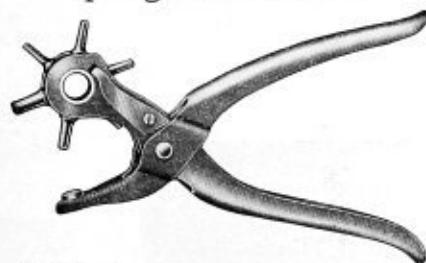
No.	1	2	3	4	5	6	7	8
Twist Drill Gauge.....	40	35	30	25	20	14	8	2
No.	9	10	11	12	13	14	14	Special
Inches.....	$1\frac{5}{16}$	$\frac{3}{4}$	$\frac{5}{8}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{16}$	$\frac{1}{8}$	

Round Punches

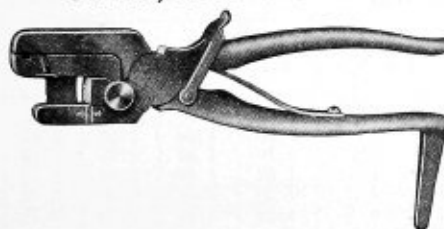
Cast Steel, Hand-Forged



Size, Inches	Price, Each	Size, Inches	Price, Each
$\frac{1}{2}$	\$1.00	$1\frac{1}{2}$	\$3.20
$\frac{3}{4}$	1.10	$1\frac{3}{4}$	3.50
$\frac{1}{2}$	1.20	2	4.00
$\frac{3}{4}$	1.30	$2\frac{1}{2}$	4.75
1	1.40	$2\frac{3}{4}$	6.00
$1\frac{1}{4}$	2.50	3	9.00

Spring Belt Punches

Single Tube, each.....	\$0.50
Four " " ".....	1.25
Six " " ".....	1.50

Cutter, Awl and Pliers

Price, each.....\$1.50

Cutters and Pliers

Nickel-Plated

5 $\frac{1}{2}$ inches long, each.....\$0.75**Superior Belt Splicing Tool**

Will cut any size hole required or will enlarge the hole with the lacing drawn without injuring the lacing.

6 $\frac{1}{2}$ Inches long, each.....\$0.35**Patent Belt Awl**

7 Inches long, each.....\$0.75

Lace Leather CutterCuts $\frac{3}{16}$ -inch to $\frac{3}{4}$ -inch wide.

Price, each.....\$0.75

Belting and Packing Shears

The teeth on the lower blade allow this shear to cut with ease all kinds of Leather, Rubber, Packing, Linoleum, Asbestos, etc.

No.	Length Over All, Inches	Price, Each
1	8 $\frac{1}{2}$	\$1.50
2	11	1.85

Rubber Conducting Hose Water Hose

Three different brands, representing three distinct grades, afford a wide range for choice. By judicious selection from this line, the needs of almost any service may be met.

"Bullock"



Our Bullock brand is first quality and the best grade of water hose we carry. It is guaranteed in every way. It has good strength, durable construction and long life friction. For general service it is very economical.

"Castor"



Next to Bullock, our Castor Brand is the best grade we carry. It is made of heavy duck and good friction. It is a very good medium quality hose and one that will give good satisfaction.

"Helmer"



Our Helmer brand is a light weight hose. Suitable for light pressure. We consider "Helmer" a very good low priced hose.

Price Per Foot

Internal Diam., inches	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	Internal Diam., inches	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply
1/2	\$0.20	\$0.25	\$0.30	\$0.37	\$0.45	2 1/2	\$0.83	\$1.00	\$1.25	\$1.56	\$1.87
3/4	.25	.30	.37	.46	.55	3	.99	1.20	1.50	1.87	2.25
1	.33	.40	.50	.62	.75	3 1/2	1.16	1.40	1.75	2.18	2.62
1 1/4	.42	.50	.62	.77	.93	4	1.32	1.60	2.00	2.50	3.00
1 1/2	.50	.60	.75	.93	1.12	5	1.65	2.00	2.50	3.13	3.75
2	.66	.80	1.00	1.25	1.50	6	1.98	2.40	3.00	3.75	4.50
2 1/4	.75	.90	1.12	1.40	1.68	...	....	....	....	....	....

All regular sizes are carried in stock.

Garden Hose for the Lawn



Garden Hose

Garden hose is made in several plies, the outside cover of rubber, an interlining of fabric or duck and the inner tube of rubber. The test of quality lies in the elasticity and toughness of the rubber cover and the rubber tube, the holding strength or tenacity of the friction uniting the different plies, and the make and strength of the cotton fabric.

Quite commonly one makes the mistake of assuming weight as the essential virtue of garden hose. This should be guarded against vigilantly, as there is as much danger in having a hose over-weight as having it under-weight. For common lawn sprinkling and wetting down purposes, a medium weight hose will last longer and wear better than the heavy, by reason of the fact that it is easier to handle and not so susceptible to kinks.

All our garden hose is coupled, ready for use: We have the following brands:

"Bullock"

This is the best grade of garden hose we carry. It is specially well made, has good strength, durable construction, long life friction and is the best and most economical hose for general service. Recommended and guaranteed in every way. Made in 3 and 4-ply.

"Helmer"

To the purchaser that wants the assurance of good wearing and durable hose, one that will last for years under the right precaution and treatment, we offer our "Helmer" Brand.

The material used in its make-up is much above the ordinary. It wears so well and is so easy to handle that it is one of our most popular grades. Made in 3 and 4-ply.

"Standard"

Standard Brand, although our lowest priced hose, represents good value for the money. To those demanding a low-priced hose, it can be offered with the absolute surety that on an equal basis of price it cannot be beaten. Made in 3 and 4-ply.

Garden hose is made up in the $\frac{3}{4}$ -inch size almost exclusively, but we carry the $\frac{1}{2}$ -inch as well.

Cotton Garden Hose

"Samson"

Our Samson cotton garden hose is made of the strongest long staple cotton yarn. The lining is of an excellent grade of rubber made perfectly smooth. This is, we believe, the best cotton garden hose made. Coupled, in 50-foot lengths.

"Harrison"

Our Harrison brand of Garden hose is made of the same materials as our Samson brand. Is strong and durable, but somewhat lighter in fabric. Coupled, in 50-foot lengths.

Steam Hose

The ideal steam hose should not soften or harden in use at high temperature, but in actual practice it is found that it is impossible to make such a hose. The nearer, however, the hose comes to these ideal conditions the better is the hose.

The strength and durability of steam hose does not depend upon the amount of hydraulic pressure the hose will stand, but depends almost entirely upon its construction and composition of the rubber.



For any given pressure the strain in a steam hose increases with the diameter. Therefore the larger sizes of hose must be made with proportionately greater strength. In steam hose the conditions are made worse by the increase of temperature with the higher pressures, and care should be exercised in selecting a proper hose. There is no economy in cheap steam hose, even for ordinary use.

"Bullock"

A high-grade steam hose. The wall of a 6-ply Bullock steam hose is half inch, and the inner lining is made of an exceptionally high test rubber tube. We recommend it in every way. There is as good value in it as in any steam hose.

"Channon Special"

Woven Painted Jacket Steam Hose, made to render the greatest service when working under 150 pounds steam pressure. Actual tests have proven this hose superior to anything made for high pressure work.

For list prices, advance standard list two plies.

"Castor"

A good steam hose suitable for pressure not too high. For all around purposes is very desirable.

"Helmer"

Made in 3-ply and 4-ply for moderate steam pressure. A perfectly reliable hose. Not cheaply constructed, but lighter in weight than the Castor.

Price per Foot

Internal Diameter, inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply	Internal Diameter, inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
1/2	\$0.43	\$0.51	\$0.63	\$0.76	\$0.89	\$1.02	1 1/2	\$1.02	\$1.25	\$1.56	\$1.87	\$2.18	\$2.50
3/4	.51	.67	.83	1.00	1.17	1.34	2	1.34	1.66	2.07	2.49	2.90	3.32
1	.67	.83	1.03	1.24	1.45	1.66	2 1/4	1.50	1.87	2.33	2.80	3.27	3.74
1 1/4	.85	1.04	1.30	1.56	1.82	2.08	2 1/2	1.66	2.08	2.60	3.12	3.64	4.16

The following table will be found convenient to consult for ordinary pressures. When extreme pressures are encountered it would be well to consult us.

20 lbs. Working Pressure Generates 250° Heat	40 lbs. Working Pressure Generates 287° Heat	60 lbs. Working Pressure Generates 307° Heat	80 lbs. Working Pressure Generates 324° Heat	100 lbs. Working Pressure Generates 338° Heat
4-ply for 1/2	4-ply for 1/2	4-ply for 1/2	6-ply for 1/2	8-ply for 1/2
4-ply for 3/4	4-ply for 3/4	5-ply for 3/4	6-ply for 3/4	8-ply for 3/4
4-ply for 1	4-ply for 1	6-ply for 1	8-ply for 1	10-ply for 1
4-ply for 1 1/4	4-ply for 1 1/4	6-ply for 1 1/4	8-ply for 1 1/4	10-ply for 1 1/4
4-ply for 1 1/2	5-ply for 1 1/2	6-ply for 1 1/2	9-ply for 1 1/2	10-ply for 1 1/2
4-ply for 2	6-ply for 2	8-ply for 2	10-ply for 2	.....

Air or Pneumatic Hose



Air Drill Hose

To follow the rock drill day after day, over rough and sharp ground, conveying air under high pressure, requires a hose of quality and endurance. Air Drill Hose is made of special construction to withstand the hard use to which it is subjected. The outside ply, instead of being inserted in the hose, is wound on the outside to protect it from coming in contact with oils or other substances which tend to rot or destroy the rubber.

We have two grades, either of which may be protected by wire or marline. The wire-wound hose is generally recommended for its better ability to withstand the severe abrasion to which it is constantly exposed.

Bullock

"Bullock" is a heavy service air hose of extra strong construction and made for all ordinary work.

Helmer

"Helmer" is our light grade air hose. It is the same in quality but not so heavy in construction as our Bullock.

Air Drill Hose Price List

Internal Diameter, Inches	PRICE, PER FOOT			
	3-Ply, 2-Ply Inside, 1-Ply Outside	4-Ply, 3-Ply Inside, 1-Ply Outside	5-Ply, 4-Ply Inside, 1-Ply Outside	6-Ply, 5-Ply Inside, 1-Ply Outside
1/2	\$0.43	\$0.51	\$0.63	\$0.76
3/4	.51	.67	.83	1.00
1	.67	.83	1.03	1.24
1 1/4	.85	1.04	1.30	1.56
1 1/2	1.02	1.25	1.56	1.87

For wire and marline winding see index.

Divers' Hose

Strong, light and flexible. Peculiarly well adapted to resist kinking, abrasion and cutting. Used in supplying air to submarine divers.

For diving outfits see index.

High Pressure Air Drill Hose

Our Channon's special jacketed air drill hose is a special grade, made for unusual pressures. We make special net prices per foot on it. In ordering, state pressure and nature of the service.

Pneumatic or Air Tool Hose

Bullock Brand

Our Bullock Brand Air Tool Hose combines in its makeup the features of strength, lightness, flexibility and durability. The stock used in the tube is especially compounded for resisting, to as great an extent as possible, the deteriorating effects of the oil that comes from the air compressor.

Bullock brand is a highly economical air tool hose, as proved by long and varied service tests. Made with 5-ply of heavy sheeting in small sizes, and with 4-ply of medium weight duck in larger sizes.

List Price, Per Foot

Internal Diameter, Inches	Price, Per Foot
3/8	\$0.43
1/2	.51
3/4	.67
1	.83

For wire or marline winding see index.

Brewers' Hose

Our "Bullock" grade of brewers' hose has stood the highest test and has given the best results in actual service.

It has a perfectly smooth, acid resisting tube, made of pure, inodorous rubber. The cover is made extra thick of tough durable stock, to withstand the wear and tear brewers' hose receives.

For price list, same as steam hose list.

Acid Hose

Great care is required to make a hose to withstand the action of acids. Our "Bullock" brand is constructed of absolutely pure gum of the highest quality, and can be used with the strongest acids. This hose is made of different thicknesses of tube and cover, as the customer may order; usually, however, it is made of tubes either 1/2, 3/4 or 1 inch thick. In ordering, specify the kind and strength of acid to be conveyed and we will furnish hose to meet the requirements.

Flexible Steel Armored Hose

For Steam or Compressed Air



View of Construction

The armor is composed of interlocking strips of galvanized steel, wound spirally upon best grade rubber hose in such a manner that extreme flexibility is obtained without exposing the rubber to external injury, even upon the sharpest bend.

The hose is entirely covered by steel.

All hose tested under great hydraulic pressure before shipping.

Hose cannot expand or stretch. Cannot flatten or kink. Maintains uniform internal diameter.

Steam and Air Hose

Price, Per Foot

Inside Diameter	Steam Hose 150 Lbs. Pressure	Special Air Drill Hose	Air Hose
$\frac{1}{2}$ inch	\$0.85	\$0.60	\$0.40
$\frac{3}{4}$ "	1.10	.80	.60
1 "	1.35	1.00	.80
$1\frac{1}{4}$ "	1.65	1.25	1.00
$1\frac{1}{2}$ "	2.00	1.55	1.25

Larger sizes* to order.

Steam Hose—Be sure to specify whether wanted for 100 lbs. or 150 lbs. pressure.

Air Hose—Will stand 500 lbs. working pressure. This hose has been tested to as high as 2,000 lbs. without a leak.

Special Air Drill Hose—Has a special high grade lining to withstand as much as possible the action of oil.

Pneumatic Tool and Water Hose

Price, Per Foot

Inside Diameter	Pneumatic Hose	Water Hose
$\frac{3}{4}$ -inch	\$0.35	.....
$\frac{1}{2}$ "	.40	\$0.40
$\frac{3}{4}$ "	.60	.60
1 "	.80	.80
$1\frac{1}{4}$ "	.....	1.00
$1\frac{1}{2}$ "	.....	1.25

Malleable Iron and Brass Couplings

For Steam, Air Drill and Air Hose



Style B Coupling with Swivel and Spud
Std. Iron Pipe Thread

Style BB Coupling

Same as Style B Coupling, except it has no swivel and is furnished with female iron pipe thread only.

Price, Per Set

Size, inches	STYLE "B"		STYLE "BB"	
	Malleable Iron	Brass	Malleable Iron	Brass
$\frac{1}{2}$	\$3.00	\$ 5.50	\$1.35	\$3.00
$\frac{3}{4}$	3.50	7.00	1.75	4.25
1	4.25	8.50	2.25	5.25
$1\frac{1}{4}$	5.00	11.00	2.65	6.25
$1\frac{1}{2}$	6.50	13.00	3.00	7.50



Style A Coupling—Made in Brass Only

Size, Inches	Price, Per Set	Size, Inches	Price, Per Set
$\frac{1}{2}$	\$10.00	$1\frac{1}{4}$	\$24.00
$\frac{3}{4}$	13.00	$1\frac{1}{2}$	31.00
1	17.00	.....	.....

Couplings for Pneumatic Tool Hose (Mall. Iron)

Style PB is like Style BB, except that it has male pipe thread and is for pressures over 100 lbs. Style C is for under 100 lbs. Both styles fitted with male nipples to which can be attached any make of quick acting couplings.

Size, Inches	PRICE, PER SET	
	Style "PB"	Style "C"
$\frac{3}{4}$	\$1.50	\$1.00
$\frac{1}{2}$	1.50	1.25
$\frac{3}{4}$	2.00	1.50
1	2.50	1.75

Splicing Clamps



Size, Inches	Price, Each	Size, Inches	Price, Each
$\frac{1}{2}$	\$1.50	$1\frac{1}{4}$	\$3.00
$\frac{3}{4}$	2.00	$1\frac{1}{2}$	3.50
1	2.50	.....	.....

Suction Hose

Suction hose differs from conducting hose principally in being made to withstand an exterior collapsing tendency instead of an internal bursting pressure. The stiffness of form necessary to resist the tendency to collapse is usually provided by an insertion of wire—round or flat—of suitable size and wound in proper helical pitch.

Construction

Smooth Bore

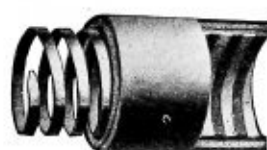
- Inside to outside:
1. Rubber tube.
 2. Ply of canvas.
 3. Wire imbedded in rubber.
 4. Canvas plies to give weight and strength and make perfectly air-tight.
 5. Outside rubber covering.



Smooth Bore

Rough Bore

- Inside to outside:
1. Wire.
 2. Ply of canvas to prevent cutting of rubber.
 3. Rubber tube.
 4. Canvas plies to give weight and strength and make perfectly air-tight.
 5. Outside rubber covering.



Rough Bore

"Bullock"

A Suction Hose of the highest possible quality, made to meet the requirements of steam and fire engines, sand dredges, mining service and other severe classes of work.

"Castor"

This is a good quality hose which fully satisfies the conditions imposed by general suction work.

"Helmer"

Well adapted for general use in the smaller sizes.

Suction Hose Stock List

The following sizes and lengths are regularly carried in stock. Immediate delivery can ordinarily be made on orders for any of these stock goods.

Smooth and Rough Bore

Size 3-inch, in lengths of 10, 12, 15, 18 and 20 feet.

Sizes 4, 5 and 6-inch, in lengths of 10, 12, 15 and 20 feet.

Sizes 8 and 10-inch, in lengths of 12 feet only.

Hard Rubber

In any length up to 50 feet.

On all Suction Hose we can attach iron pipe nipples or couplings. Usually we wire nipples on the larger sizes and attach couplings on the smaller sizes.

Do not use suction hose on a discharge pipe unless made for that purpose.

Smooth Bore

Internal Diameter, Inches	Price Per Foot	Internal Diameter, Inches	Price Per Foot
2	\$2.60	6	10.50
2½	3.50	8	16.50
3	4.50	10	22.50
4	6.50	12	27.50
5	8.50	.....	.....

Rough Bore

Internal Diameter, Inches	Price Per Foot	Internal Diameter, Inches	Price Per Foot
2	\$2.30	6	\$9.50
2½	3.10	8	15.00
3	4.00	10	20.00
4	5.80	12	25.00
5	7.60	.....	.....

Hard Rubber Suction

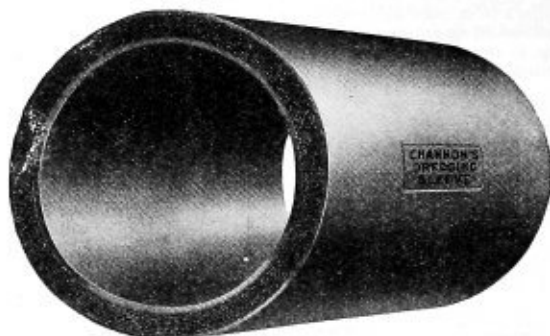
For Agricultural Purposes Mainly

Internal Diameter, Inches	Price Per Foot	Internal Diameter, Inches	Price Per Foot
¾	\$0.65	1½	\$1.13
1	.75	.....	.....
1¼	.93	.....	.....

Hydraulic Mining-Hose

Made in diameters up to twelve inches without rubber lining. Net prices quoted upon application.

Dredging Sleeves



Dredging sleeves or rings are used as flexible connections between sections of pipe for conveying dredged material to the bank of a river, shore of a lake or other point of deposit.

They are made from 12 inches to 36 inches diameter, with a heavy rubber tube and from 6 to 12 plies of duck. Great care is exercised in making our sleeves, which enables them to withstand severe wear and strain and guarantees the best possible results. Samples and prices sent upon application.

Pure Rubber Tubing

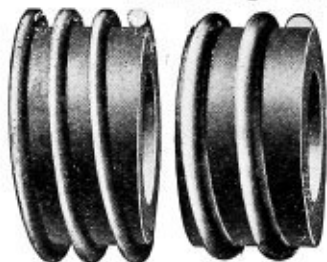


This tubing is made plain or corrugated, and can be furnished in any diameter of hole or thickness of wall desired. The different uses for which this tubing is intended require different grades, so that it is advisable when ordering to specify the quality desired or the use to which the tubing is to be put.

Cloth Insertion Tubing

Cleanliness being an essential requirement in the service for which tubing of this sort is commonly used, high quality is imperative in its manufacture. The inner tubes are smooth, of high grade white rubber, with two or more plies of fabric and a heavy jacket of red rubber. Samples and prices upon application.

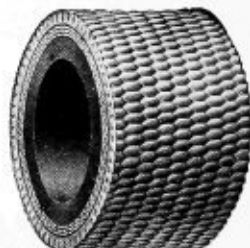
Windings for Steam, Water or Air Hose



Round Wire Half-Round Wire



Marline



Painted Woven Jacket

A steam-hose with many insertions of cotton duck is so hard and inflexible that as a hose it is practically useless. To overcome this feature it has been found good practice to cover the hose with marline, woven cotton, or wire. Such covering adds greatly to the strength without impairing the flexibility. As an example, a 4-ply marline-wound is equal in strength to a six-ply plain hose, and costs less. We do not recommend small hose with more than six-ply insertions, nor large hose with more than eight or ten. In all cases the number of plies must be in proportion to the diameter. The choice of covering depends largely upon the work for which the hose is intended.

Fire Hose—Cotton, Rubber-Lined

Designed Especially for Municipal Fire Protection

“Sterling” Fire Hose

Single Jacket



Our “Sterling” brand fire hose is made of the best grade of cotton fabric, composed of selected long fibre cotton, specially treated to prevent mildew or rot, and woven so as to be of uniform strength and pliability. The lining is of fine Para rubber, cemented to the fabric in such a way that the waterway is perfectly smooth and will remain so under pressure. The single jacket is designed for fire protective service in towns of medium size; also for factories, railway shops, mills, etc., where an extra strong and durable hose is required. It is guaranteed to withstand a test pressure of 300 lbs. per square inch when delivered. It is lighter than the double jacket hose and costs less, but is as serviceable as the heavier hose, provided the wear and tear is less severe.

List of Single Jacket

Inside Diameter, inches	Price, Per Foot	Inside Diameter, inches	Price, Per Foot
2	\$0.65	2½	\$0.75

Double Jacket



Our double jacket “Sterling” brand fire hose is made of the highest quality of material, with special reference to obtaining the greatest strength, combined with a smooth lining which will give a most effective fire stream. Both jackets are made of selected long fibre cotton, specially treated. The outer jacket can be renewed when worn out or burned. The lining is made of three layers of rubber, calendered one over the other to obviate pin holes or checks. We guarantee that this hose will stand at least 400 pounds test pressure on delivery, and that it will discharge as great a volume of water as any hose made of the same diameter.

List of Double Jacket

Sold only in 50-foot lengths.

Inside Diameter, inches	Price, Per Foot	Inside Diameter, inches	Price, Per Foot
2	\$0.80	3	\$1.40
2½	1.00	.....	.....

2½-inch is the most popular size. See opposite page about couplings.

Mill Hose

Cotton Rubber-Lined and Unlined Linen Hose



Cotton rubber-lined hose is now used almost universally by factories and fire departments for fire protection on account of its wearing qualities, pliability, lightness and strength.

"Sampson" Mill Hose

Our Best Grade

Sampson Cotton Rubber-Lined Mill Hose complies with the requirements of the Associated Factory Mutual Insurance Companies for fire protection. The fabric is the strongest long staple cotton, and the lining an excellent grade of rubber made perfectly smooth. It is mildew proof and thoroughly reliable. Guaranteed to stand 300 pounds test pressure on delivery.

"Harrison" Mill Hose

This hose is made of the same quality of materials as "Sampson," but is somewhat lighter in fabric and tube. It is strong and durable and guaranteed to stand a test pressure of 250 pounds on delivery.

Prices—Cotton, Rubber-Lined Mill Hose

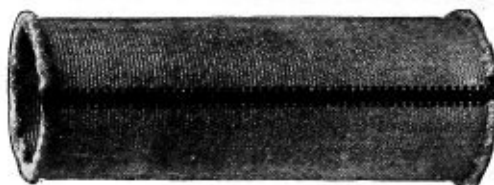
Diameter, inches	Price, Per Foot, 50-ft. Lengths	Diameter, inches	Price, Per Foot, 50-ft. Lengths
1	\$0.35	2	\$0.60
1¼	.45	2½	.70
1½	.50	...	...

About Couplings

We sell more 2½-inch cotton rubber-lined hose than of all the other sizes put together. We can furnish automatic or common hose couplings. Couplings with special thread are made to order and cannot be returned.

Unlined Linen Hose

Unlined Linen Hose is often preferred where the hose is only for use in emergency cases, and the rest of the time lies folded on a rack.



"Underwriters"

We guarantee our "Underwriters" Linen Hose to be made in accordance with the specifications of the Associated Factory Mutual Insurance Companies, and acceptable to the Chicago Board of Underwriters. We furnish labels to that effect.

"Standard"

"Standard" Brand is our cheaper grade of unlined Linen Hose. It is extensively used, especially in the smaller sizes, and under light pressures it is giving satisfactory results. Made in 1, 1¼, 1½, 2, 2¼ and 2½-inch diameter.

Play Pipes and Nozzles



**Brass
Swivel Handle
Play Pipe**



**Plain Brass
Hose Nozzle**



**Brass
Hose Nozzle
with Cock**



**Brass
Hose Pipe
with Screw Tip**

Brass Swivel Handle Play Pipes have the following advantages:

FIRST—That the handles are placed in such shape as to conform to the position of the pipeman, without cramping the hand or arm into an unnatural position.

SECOND—It often happens that the hose turns two or three times over when the water is forced through it. If the handle did not swivel so as to allow the pipe to rotate, it would wrench it from the pipeman and subject him to danger and the pipe to harm. Cut shows wound and painted.

Brass Swivel Handle Play Pipes

Size, inches	Length, inches	Plain Brass, Price Each	Wound and Painted, Price Each
2	20	\$ 7.50	\$ 9.00
2½	24	9.50	11.00
2½	30	11.00	12.00
2½	36	13.50	15.00

Brass Hose Pipes or Nozzles

With Screw Tips

Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
¾	7½	\$0.80	2	12	\$ 3.80
¾	12	1.00	2	15	4.50
1	8½	1.00	2	20	5.00
1	12½	1.20	2½	15	7.50
1¼	12	2.00	2½	20	9.00
1¼	15	2.40	3½	24	10.00
1½	13	2.50	2½	30	14.40
1½	15	3.00	2½	36	15.70
1½	20	3.60			

Brass Hose Nozzles

With Cocks

Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
¾	8	\$1.30	1½	12	\$ 5.50
¾	12	1.80	1½	15	6.50
1	8	1.50	2	12	8.00
1	12	2.00	2	20	11.00
1¼	12	4.00	2	25	13.00
1¼	15	5.00			

Plain Brass Hose Nozzles

Without Screw Tips or Cocks

Size, inches	Length, inches	Price Each	Size, inches	Length, inches	Price Each
¾	4	\$0.50	1½	12	\$2.20
¾	6	.70	2	6¾	2.60
1	4	.50	2	12	3.40
1	8	.90	2½	7½	3.75
1¼	4¾	1.20	2½	12	5.50
1¼	12	1.80	2½	15	6.50
1½	5¾	1.80	2½	22	9.00



Gem Garden Hose Nozzles

These nozzles throw a good straight stream, or can be graduated from a fine mist to a coarse spray.

Regular Water Hose Couplings

 $\frac{3}{4}$ and 1 Inch Size $1\frac{1}{4}$ Inch and Larger

For Hose	Price, Per Pair	Price, Per Doz. Pairs
$\frac{1}{2}$ and $\frac{3}{4}$	\$0.24	\$ 2.40
1	.44	4.40
$1\frac{1}{4}$	1.00	10.00
$1\frac{1}{2}$	1.40	14.00
2	2.40	24.00
$2\frac{1}{2}$	4.80	48.00
3	7.50	75.00

When ordering state whether hose thread or iron pipe thread is wanted.

Steam Hose Couplings

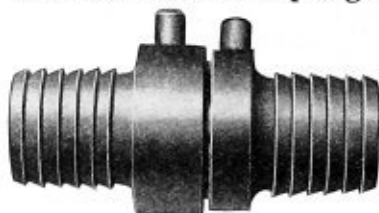
With long shank, for steam hose or water hose under heavy pressure.



For Hose	Price, Per Pair	Price, Per Doz. Pairs
$\frac{1}{2}$ and $\frac{3}{4}$	\$1.50	\$15.00
1	1.80	18.00
$1\frac{1}{4}$	2.40	24.00
$1\frac{1}{2}$	3.00	30.00
2	4.20	42.00
$2\frac{1}{2}$	7.20	72.00
3	12.00	120.00

These long shank couplings are usually furnished with iron pipe thread.

Suction Hose Couplings



For Hose	Price, Per Pair	For Hose	Price, Per Pair
2	\$4.00	4	\$12.50
$2\frac{1}{2}$	5.25	$4\frac{1}{2}$	16.00
3	7.50	5	20.00
$3\frac{1}{2}$	9.50	6	24.00

Iron pipe nipples are usually used for large size suction hose.

Iron Pipe Nipples

For Suction Hose



Size, inches	Total Length, inches	Price Each	For Wiring In., Each
2	7	\$0.60	\$1.70
$2\frac{1}{2}$	7	.90	1.80
3	8	1.25	1.90
$3\frac{1}{2}$	10	1.75	2.20
4	10	2.00	2.50
$4\frac{1}{2}$	12	3.00	2.60
5	12	3.60	2.75
6	14	5.00	3.75
7	16	7.25	4.25
8	16	8.75	4.75
10	20	16.25	5.75
12	20	25.00	6.50

These nipples should be wired in the ends of suction hose. We can do this if so instructed.

Expansion Ring or Automatic Couplings

The principal advantage of automatic hose couplings over common couplings is that by their use a smooth and unobstructed waterway is obtained.



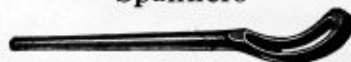
In ordering automatic couplings a description of the thread will not do unless it is iron pipe thread or hose thread. We cannot take back couplings which are made up to order. These couplings are used usually on cotton rubber-lined mill and fire hose. Prices on application.

Expansion Rings



Carried in stock from 1 to $2\frac{1}{2}$ inches.

Spanners



Made in sizes $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ inches.



**Hose
Nipples**



Male and Female

Size, inches	Price Per Dozen	Size, inches	Price Per Dozen
$\frac{1}{2}$	\$ 3.50	2	\$14.00
$\frac{3}{4}$	3.50	$2\frac{1}{2}$	28.00
1	5.00	3	40.00
$1\frac{1}{4}$	9.00	$3\frac{1}{2}$	50.00
$1\frac{1}{2}$	10.00	4	75.00

Hose Reducers

Hose Bushings



Size, inches	Per Dozen	Size, inches	Per Dozen
$1 \times \frac{3}{4}$	\$ 6.50	$2 \times 1\frac{1}{2}$	\$18.00
$1\frac{1}{4} \times \frac{3}{4}$	8.00	$2\frac{1}{2} \times \frac{3}{4}$	20.00
$1\frac{1}{2} \times 1$	10.00	$2\frac{1}{2} \times 1$	22.00
$1\frac{3}{4} \times 1$	11.50	$2\frac{1}{2} \times 1\frac{1}{4}$	23.00
$1\frac{1}{2} \times 1\frac{1}{4}$	11.50	$2\frac{1}{2} \times 1\frac{1}{2}$	24.00
$1\frac{1}{2} \times 1\frac{1}{2}$	12.00	$2\frac{1}{2} \times 2$	26.00
$2 \times \frac{3}{4}$	13.00	3×2	30.00
2×1	14.00	$3 \times 2\frac{1}{2}$	36.00
$2 \times 1\frac{1}{4}$	16.00		

Hose Clamps
Single Bolt for Water Hose



For Use	Price Each	Price Per Dozen
$\frac{1}{2}$ and $\frac{3}{4}$	\$0.15	\$1.50
1	.20	2.00
$1\frac{1}{4}$	.25	2.50
$1\frac{1}{2}$	.30	3.00
2	.40	4.00
$2\frac{1}{2}$	.70	7.00
3	1.00	10.00

In ordering, always specify the ply of the hose for which the clamps are required.

Extra Heavy Clamps, for Steam Hose

Size, Inches	Price Per Dozen	Price Each
$\frac{1}{2}$	\$2.00	\$0.20
$\frac{3}{4}$	2.00	.20
1	2.50	.25
$1\frac{1}{4}$	3.00	.30
$1\frac{1}{2}$	3.50	.35



**Double Bolt
Hose Clamps
in Halves**

The Double Bolt Hose Clamp is made in halves with bolt at each side. Used principally on large diameter hose.

Inside Diam., in.	Price Per Doz.	Inside Diam., in.	Price Per Doz.	Inside Diam., in.	Price Per Dozen
4	\$11.25	6 $\frac{1}{2}$	\$26.00	8 $\frac{1}{4}$	\$42.00
4 $\frac{1}{4}$	13.75	6 $\frac{3}{4}$	28.00	8 $\frac{1}{2}$	44.00
4 $\frac{1}{2}$	15.25	6 $\frac{7}{8}$	30.00	8 $\frac{3}{4}$	46.00
4 $\frac{3}{4}$	16.75	7	32.00	9	48.00
5	18.25	7 $\frac{1}{4}$	34.00	9 $\frac{1}{4}$	50.00
5 $\frac{1}{4}$	19.75	7 $\frac{1}{2}$	36.00	9 $\frac{1}{2}$	52.00
5 $\frac{1}{2}$	21.25	7 $\frac{3}{4}$	38.00	9 $\frac{3}{4}$	54.00
5 $\frac{3}{4}$	22.75	8	40.00	10	56.00
6	24.25				

McChesney Steel Wire Hose Bands and Hose Clamping Tool

An entirely new method of putting on hose clamps or bands.



Price List

No.	Size Hose, inches	Gauge of Wire	Number in Box	Price Per 1,000
00	$\frac{1}{4}$ - $\frac{1}{2}$	15	100	\$12.00
0	$\frac{1}{2}$ - $\frac{3}{4}$	15	100	13.00
1	1	13	100	15.00
2	$1\frac{1}{4}$ -2	12	100	30.00
3	2-3	11	50	23.00
4	3-4	11	50	35.00
5	4-5	10	50	37.00
6	5-6	10	50	38.00

Hose Clamping Tool, each. \$5.00

Hose Valves

With leather disc and with either wheel or tee handle.



Size, inches	Price Each
$\frac{3}{4}$	\$1.65
1	3.15
$1\frac{1}{4}$	3.70
$1\frac{1}{2}$	4.75
2	7.00
$2\frac{1}{2}$	8.50



Hydrant Gates

They are attached to the hydrant so that one stream can be stopped without interfering with the other.

For $2\frac{1}{2}$ inch Hose, Single, \$10.00 each. Double, \$25.00 each.

Single



Double



**To Divide
One Stream**

Siamese Connections

For $2\frac{1}{2}$ inch Hose.
Price, \$10.00 each



**To Unite
Two Streams**

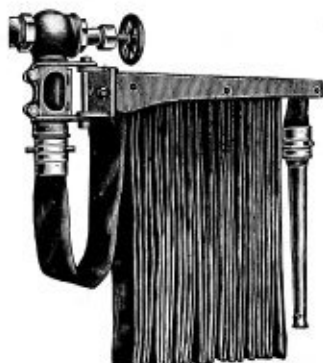
Siamese Connections For Stand Pipes

Size Iron Pipe..... 3 Inches
Size both Nozzles..... $2\frac{1}{2}$ Inches

Price..... \$15.00 Each



Hose Reels and Racks

**"Crown" Swinging Hose Rack**

The Crown Swinging Hose Rack is especially designed for unlined linen hose. The hose is hung on galvanized metal pins which swing free as each lap of hose is withdrawn; made adjustable in width to accommodate 1 inch to 2½ inch hose.

Swinging Hose Rack. Notice the hump; it saves the hose. The end of rack is partially enclosed to prevent the entire length of hose being thrown to the floor by a sudden jerk.

Swinging Hose Reel made of steel tubing, steel rod, wire and malleable castings; has tension axles so reel may be adjusted to run tight or loose and swing to any angle from the wall.

Any of these racks can be furnished with wall brackets or pipe clamps. No extra charge for pipe clamps up to and including 4 inch.

Crown Swinging Hose Rack

No. 15 capacity 25 to 75 feet unlined linen hose..... Price Each \$5.00
No. 16 capacity 100 to 150 feet unlined linen hose..... Price Each 6.00

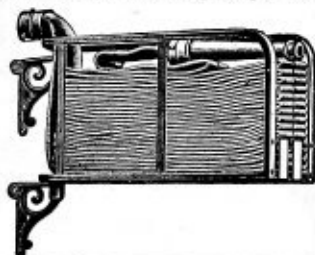
Rack will hold one-half the above quantity of cotton rubber-lined hose.

Swinging Hose Rack

No.	Size of Hose, inches	Capacity Unlined Linen Hose, feet	Capacity Rubber-Lined Cotton Hose, feet	Price Each
A0	1½	50	...	\$5.00
A00	2½	50	...	5.00
A1	1½	100	...	6.00
A2	2½	100	...	6.00
A3	1½	150	50	7.00
A4	2½	150	50	7.00
A5	1½	200	100	7.50
A9	2½	200	100	8.00
...

Swinging Hose Reel

No.	Size of Hose, inches	Capacity Unlined Linen Hose—Feet	Capacity Rubber-Lined Cotton Hose, Feet	Price Each
0	1½	50	...	\$ 6.00
00	2	50	...	6.00
000	2½	50	...	6.00
2	1½	150	50	6.00
3	2	150	50	6.00
4	2½	150	50	6.50
5	1½	...	100	7.50
6	2	...	100	8.00
7	2½	...	100	8.50
8	2½	...	150	11.50

Angle Iron Swinging Rack

Size Hose, inches	Capacity, feet	PRICE EACH			
		For Unlined Linen Hose		For Cotton Rubber Lined Hose	
		No.	Price	No.	Price
1½ or 1¾	50	70	\$5.00	76	\$7.00
2	50	71	5.00	77	7.00
2½	50	72	5.00	78	7.00
1½ or 1¾	100	73	6.00	79	7.50
2	100	74	6.00	80	7.50
2½	100	75	6.00	81	8.00

Reels for Garden Hose**Wooden Reel**

Made of hardwood, oil finish. Capacity, 100 ft. of ¾-inch hose.

**Metal Reel**

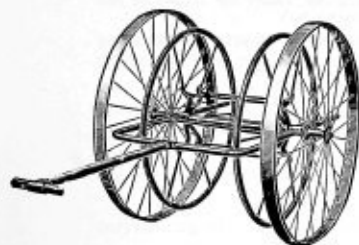
Tubular frame, corrugated drum. Capacity, 100 feet of ¾-inch hose.



In ordering always give number of Rack or Reel for which they are required. When Pipe Clamps are desired advise size of Pipe

"LITTLE KNOX" HOSE CARTS

Suitable for a large quantity of small hose or a small quantity of large hose.
Tubular steel reel, frame and tongue, steel wheels with 2-inch tires.



No. of Reel.....	90	100	110
Height of wheels in inches.....	34	36	38
Extreme outside width in inches.....	31	33	36
Weight of Carts, complete, in lbs.	65	90	95
Capacity of 1 $\frac{1}{2}$ -inch 3-ply Rubber Hose.....	500 ft.	600 ft.	800 ft.
" " 1 " " " " " " " "	200 "	300 "	400 "
" " 1 $\frac{1}{4}$ " " " " " " " "	150 "	200 "	300 "
" " 1 $\frac{1}{2}$ " " " " " " " "	100 "	150 "	200 "
" " 1 $\frac{1}{4}$ " " Cotton Rubber-lined Hose.....	300 "	400 "	500 "
" " 1 $\frac{1}{2}$ " " " " " " " "	200 "	300 "	400 "
" " 2 " " " " " " " "	150 "	200 "	300 "
" " 2 $\frac{1}{2}$ " " " " " " " "	100 "	150 "	250 "
Price.....	\$12.00	\$17.00	\$25.00

THE "KNOX" HOSE CARTS

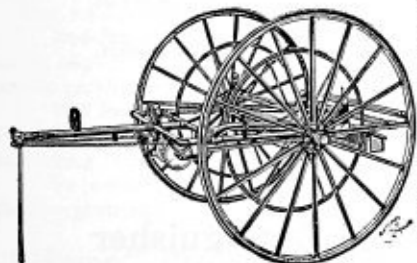
For railroads, mills, factories, and warehouses. Tubular iron frame and steel wheels. Very strong.



No. of Cart.....	101	102	103
Height of wheels in inches.....	42	48	52
Extreme outside width in inches.....	42	48	54
Weight in lbs.....	140	190	230
Capacity of 1½-inch 4-ply Rubber Hose.....	300 ft.	500 ft.	600 ft.
" " 2½ " " " " " " " "	200 "	400 "	500 "
" " 1½ " " " " " " " "	150 "	300 "	400 "
" " 1½ " Cotton Rubber-lined Hose.....	600 "	800 "	1000 "
" " 2 " " " " " " " "	400 "	650 "	850 "
" " 2½ " " " " " " " "	300 "	500 "	700 "
Price.....	\$35.00	\$45.00	\$55.00

VILLAGE HOSE CARTS

The material and workmanship used in the construction of these carts are of the highest quality. They are of medium weight, very strong, and will endure extremely rough usage. They are mounted on wood wheels of the very best pattern; have tool box and friction roller at rear, rope reel and drag rope, nozzle holder on tongue, and tongue rest. Equipped with fireman's axe and crowbar in spring holders. Hub caps are polished brass or nickel plated, if desired. Handsomely finished in vermilion and black.



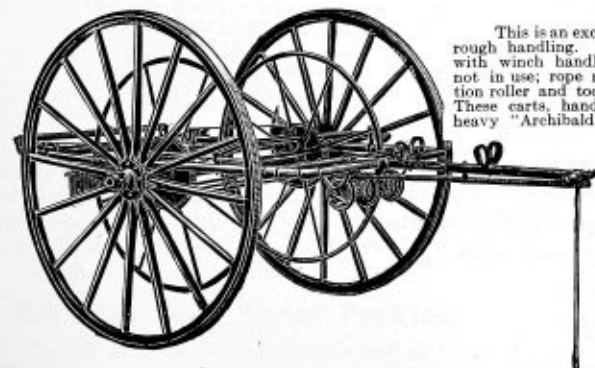
No. of Cart.	419	420	421
Height of wheels	4 ft. 6 in.	5 "	5 ft. 6 in.
Extreme outer width	4 " 6 "	5 "	5 " 6 "
Extreme length	8 ft.	8 ft. 8 in.	9 " 6 "
Weight, complete, in lbs.	335	400	500
Capacity, 2½-inch Double Jacket Fire Hose	350	400	500
Price	\$129.00	\$130.00	\$160.00

For Roller Bearings, add \$35.00 to list prices.

SPECIAL HEAVY CARTS

For Large Amount of Hose.

This is an exceedingly strong cart, and will endure an unusual amount of rough handling. It is well equipped, having a chain winding attachment with winch handles for reeling on hose; clutch to hold reel in position when not in use; rope reel and drag rope, double nozzle holders on tongue, friction roller and tool box at rear, fireman's axe and crowbar in spring holders. These carts, handsomely finished in vermilion and black, are mounted on heavy "Archibald" wood wheels.



No. of Cart.....	500	501
Height of wheels.....	5 ft. 6 in.	6 ft.
Extreme outer width.....	5 " 6 "	5 ft. 9 in
Extreme length.....	10 " 8 "	11 ft.
Weight of cart, complete, in lbs.	600	700
Capacity, 2 1/2-inch Double Jacket Fire Hose, in feet...	600	1,000
Price.....	\$250.00	\$275.00

If Roller Bearings are desired, add \$40.00 to list price.

The "Standard" Fire Extinguisher



Approved by the National Fire Protective Association, under the Rules of the National Board of Fire Underwriters

The Standard is a Safe, Reliable, Simple, perfectly constructed Slow Feed 3-gallon Fire Extinguisher, built of copper and tested to stand 350 pounds pressure to the square inch.

The Bottle Cage is simple in the extreme, made entirely of brass rod. In case of accident or misuse there is nothing about cage which cannot be repaired at home.

The Bottle, a commercial shape and size, and chemicals for re-charging can be bought in any drug store.

Elbow connecting hose to Extinguisher has extra large interior space, positively preventing corroding or clogging up.

Top Opening for filling is a very desirable feature, it being extra large (3½ inches), giving plenty of space for filling and interior examination.

The Hose Coupling is one of the greatest advantages of The Standard. It is a threaded connection easily attached or removed for cleansing the hose after use, which is very essential to preserve the life of the hose.

The Standard does not possess valves, stop-cocks, tubs, balls or other complicated devices. It does not require a shelf or bracket, as special adjustable handles are attached so it can be easily hung and removed from hook or nail.

The Standard is finished in red enamel, polished copper, or nickel plate. The enameled Extinguisher is tinned outside as well as the interior, which makes it more durable and easier kept in good condition than when otherwise finished. The enamel, unless the copper is previously coated, will soon be undermined by corrosive action.

Each Extinguisher is provided with a rubber tip over the discharge nozzle to prevent same from becoming clogged, or evaporation of the liquid.

A Charge, with printed directions, included with each Extinguisher.

Always Furnished in red enamel unless otherwise specified.

Prices, including charges, upon application

Fire Department Pump Extinguisher

Water only used; especially adapted for places where acid or chemical extinguishers are undesirable

The body of this extinguisher is made of solid copper and the trimmings of brass. The pump is a double action force pump of solid brass. When built of other metals they are soon rendered worthless by corrosion.

Capacity: 5 gallons.

Weight: 50 pounds.

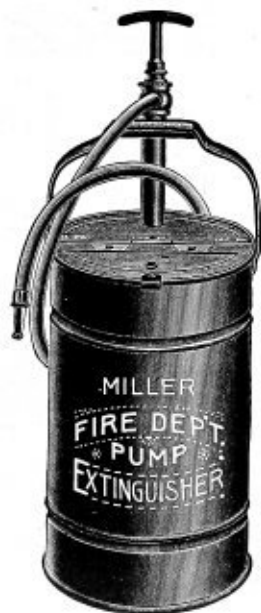
Hose: 4' ½" chemical.

Stream: About 50 feet.

Finish: Handsome red enamel and striping.

Used and endorsed by Fire Departments.

It is quickly and easily refilled.



Red Raven Red Sheet Packing



Red Raven Red Sheet Packing is made of a soft and very tenacious compound which resists the action of heat, retains a high degree of pliability in the hottest joints and will not blow out under high pressure.

Red Raven will make a cold or hot water, steam or air joint equally well and is not affected by oils, steam, alkalies or liquors. Being absolutely uniform in thickness and not affected by ammonia, it can be safely used in packing ammonia joints in ice and cold storage plants and is particularly adapted for this work.

Red Raven is light in weight and consequently lower in cost than other red sheet packings. We therefore especially recommend it to all manufacturing plants and power houses as the most satisfactory and economical packing for general service.

To prevent adhesion and more readily break joints, we recommend facing the surface of the joints with chalk or plumbago.

"Hippo" Black Sheet Packing



Hippo is especially adapted for ammonia, compressor heads, piping, etc. Never blows out, does not harden or vulcanize, but renders a flexible joint where pipes are alternately hot and cold. For steam, acids, oils and ammonia it is unsurpassed.

Width 36 inches.

Rainbow Red Sheet Packing

Carried in stock 36 inches wide and $\frac{1}{8}$ to $\frac{1}{4}$ inch thick.

Asbestos Wire Insertion Packing



Chiefly used in hot joints, where a cloth insertion packing would be rotted or burned by the heat.

Width 40 inches.

Approximate weight per roll 250 pounds.

Pure Gum Sheet

Soft, Medium, Hard



Carried in stock from $\frac{1}{8}$ -inch to 1-inch thick, 36 inches wide. Can be made as wide as 72 inches. Furnished of any density desired and of any grade of purity, according to the work for which it is required.

Pure Gum Strips

For hydraulic elevators, bulk head doors, coal-ports, dead-lights, and other marine purposes.

Cloth Insertion

Our Brands "S," "Q" and "M"

Made with cloth insertion, cloth one side or both sides.

Each cloth, whether insertion or on outside, to count as one ply.

There is one ply of cloth to every $\frac{1}{8}$ -inch thickness. Width, 36 inches. Thickness, $\frac{3}{8}$ to $\frac{1}{4}$. Approximate weight per roll, 200 pounds.

Cloth Insertion Gaskets and Rings

Regular Shapes and Sizes



There is one ply of cloth to every $\frac{1}{8}$ -inch thickness. Sizes up to and including 7x9 have 1-inch flange and are $\frac{1}{8}$ of an inch thick; larger sizes, $1\frac{1}{2}$ -inch flange, $\frac{1}{4}$ of an inch thick.

Keystone Red Tubular Gaskets

For Manholes and Handholes. Made from the Well-Known "Red Raven" Compound



The "Keystone" tubular gasket packs any joint, temporary or permanent, hot or cold, steam, water or air; cannot blow out under highest pressure; adapts itself perfectly to rough or uneven flanges; resists the action of oil, ammonia or alkalis.

Extra metal tubes and roll of tape in each box.

Put up in boxes from six to ten pounds.

Made in sizes $\frac{1}{4}$ to $\frac{3}{4}$ inch.

Asbestos Gaskets

Made of asbestos yarn interwoven with brass wire, and rubber coated—just the thing for difficult places.

When ordering, be careful to furnish exact inside and outside dimensions, together with desired thicknesses.

The Fraser Moulded Wire Gaskets

These gaskets are made of heavy material, two-ply of annealed steel wire, and moulded under hydraulic pressure of two thousand pounds. They will stand any temperature due to steam, and can be used several times.

Be careful to give exact size in ordering.

Net prices upon application

Keystone Packing

For Ammonia, Steam and Water



Expansion Ring



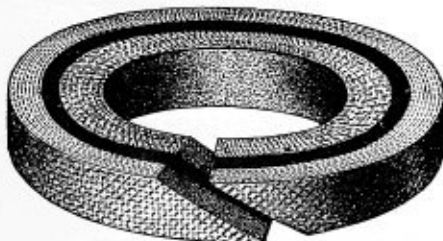
Sectional Ring



Spiral

The Keystone is made of strongly woven duck, well selected rubber friction and lubricants best adapted to meet the class of work in hand. Either for ammonia, steam or water.

Channon's Moulded Piston Packing



Made in Both Ring and Spiral Form

A cushioned packing that cannot bind or flute the rod if properly adjusted. The rubber cushion will not harden or squeeze out. It will remain perfect as long as the packing is in use. Do not fill the box to exceed three-quarters full. Keep the gland loose for expansion.

Channon's Water-Proof Hydraulic Packing



Put up in spiral form with "Red Raven" core and finest Italian flax and lubricated with graphite. This package will outwear the regular braided, soft, square flax under high pressure.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch.

Put up in boxes from 1 to 5 pounds each.

Non-X-L Packing



This is a round packing put up in spiral form with core of "Red Raven" compound, made to withstand steam, well lubricated and treated with Plumbago. It is an excellent packing for high pressure work.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch.

Put up in boxes, one coil each, about 12 feet long.

Channon's Regular and Special Diagonal Packing



This is a three-piece packing, made for low pressures up to 100 lbs., and high pressures from 100 to 250 lbs. It is self-lubricating, unaffected by steam, oils, acids, alkalis, or sulphurous waters, and its great length of life is due to its ability to successfully overcome friction.

Put up in boxes.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch.

Hemp Packing

Put up in Coils of 25, 50 and 100 Pounds



Carried in the following grades:

Italian A.

Italian B.

American A.

American B.

Hemp packing laid up in Plumbago, in 50 and 100 lb. coils.

Jute Gasket Packing

For Calking Water Mains, Etc.

Put up in coils weighing about 75 pounds each.

Miscellaneous Packings

Besides the packings listed here, we carry a small stock of miscellaneous packings, which we have not space to list. Prices quoted upon application.

Net Prices Upon Application

Flax Packing



Our Sterling Grade

Our Sterling flax packing is made of the best selection of Russian long fibre flax and well lubricated in the process of manufacture. It is well adapted to all work for which flax packing is used.

Sizes: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in. square.

Put up in boxes about 10 lbs. each.

Our No. 1 Grade

Our No. 1 Flax packing is made of good flax and properly lubricated.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in. square.

Put up in boxes about 10 lbs. each and on reels about 100 lbs. each.

Oval Braided Gum Core Packing



This packing is made with a flat gum core covered with a sufficient number of plies of finely woven flax to give the desired size. Thoroughly lubricated during process of manufacture.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1 $\frac{1}{4}$ and 1 $\frac{1}{2}$.

Put up in boxes from 5 to 10 lbs. each and on reels about 50 lbs. each.

Channon's "Empire" Gum Core Packing

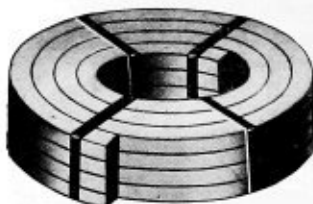
This packing is especially adapted for low pressure work, having a round gum core for its center with a series of woven flax jackets forming the structure.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$.

Put up in boxes 5 to 12 lbs. each and on reels 25 to 50 lbs. each.

Square Duck Packing

(For Pumps)



Made with black friction and white duck. For ordinary cold water use.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in. square.

Put up in 12-foot coils in boxes from 5 to 10 lbs. each.

Extra Fine Hard, Made with White Friction and Fine White Duck

For Hydraulic Packing

Under a high temperature it swells very little in service. Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in. square.

Put up in 12-foot coils in boxes from 5 to 10 lbs. each.

"Metalbestos" High Pressure Packing

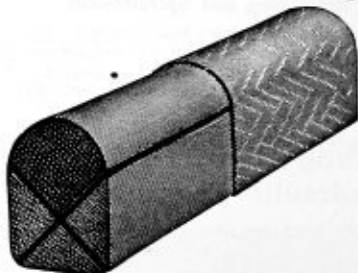


This packing is made for very severe service, with flat gum core, over which is braided a-bestos, thoroughly lubricated in process of manufacture. Over the a-bestos is braided a soft brass wire, which gives all the advantages of metal packing. We recommend this for the most severe places and in combination with our other packings. It cannot burn, char or blow out.

Sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, per lb.\$1.00

Put up in boxes from 5 to 15 lbs. each.

Black Squadron Packing



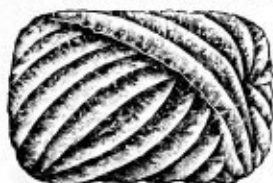
It is a wedge-constructed packing, being composed of three-quarter sections of soft square duck and one-quarter section of flax. The latter is used because it is an absorbent of lubricants and tends to keep the rod well lubricated. It takes up only two-thirds of the amount of space in the stuffing box that the old style wedge packings do.

Coils put up in boxes from 8 to 12 lbs. each.

Also furnished in Rings, made up to any size required.

Net Prices Upon Application

Asbestos Wick Packing



Our asbestos wick packing is made of the purest asbestos fiber, absolutely acid and fire-proof, and is used for packing small steam pumps, tubes, valve stems, and for similar purposes. It is put up in $\frac{1}{2}$ and 1 lb. balls.

Price, per lb.\$0.40

Asbestos Rope Packing

It is especially serviceable where superheated steam or acids are used. It is furnished on reels of from 10 to 25 lbs., in regular sizes from $\frac{1}{4}$ inch to 2 $\frac{1}{2}$ inches in diameter.

Price, per lb.\$0.40

Asbestos Mill Board

Absolutely Fire and Acid Proof



It is extensively used for packing joints of all kinds, and also for protecting wall and ceilings from overheated furnaces.

In Sheets—40x40 inches, from $\frac{1}{2}$ to $\frac{1}{4}$ inch thick.

Approximate Weight Per Sheet

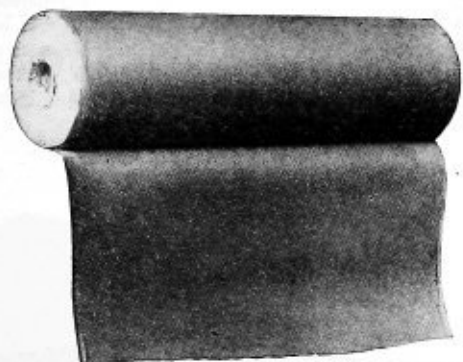
Size, inch	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{128}$
Lbs.	2	3	4	6	8	12	14	24	28

Price, per pound, in case lots of 250 lbs.\$0.07

Price, per pound, in less quantities.10

In Rolls—36 inches wide, of about 100 pounds each, $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{4}$ inches thick. Price, per pound.\$0.07

Asbestos Building Felt or Sheathing



It is used for lining all surfaces in danger of ignition by fire, as well as for covering steam pipes, hot air flues, etc. Put up in rolls of about 50 yards, and 36 inches wide, $\frac{1}{4}$, 1, 1 $\frac{1}{2}$ and 1 $\frac{3}{4}$ lbs. to the square yard, averaging 6, 8, 10 and 14 lbs. per hundred square feet. Rolls containing about 100 lbs.

Price, per lb.\$0.07

Asbestos Cement Felting



This cement is made of asbestos and other fire-proofing and cementing materials, forming a porous felting, when applied. It is to be mixed with water to the consistency of mortar, and applied with a trowel to all heated surfaces, such as drums, boilers, heaters, breechings, etc.

Put up in 100-pound bags, per pound.\$0.03

Asbestos Retort Cement

Composed of asbestos fiber, together with fire and acid proof cementing compounds, and is universally used by gas and chemical works for repairing broken clay and iron retorts and pipes, as well as for cementing fittings and sealing joints.

Price, per pound	.....\$0.10
Barrels, 400 to 600 pounds, per pound	..... .04 $\frac{1}{2}$
Kegs, 100 to 300 " "	..... .05
Pails, 25 to 50 " "	..... .06
10-pound cans, each	..... 1.00
5-pound cans, " "	..... .60
2-pound cans, " "	..... .35
1-pound cans, " "	..... .25

Asbestos Pipe Covering



In heavy sheeting, jacketed sections three feet long.

Standard List

Inside Diameter of Pipe, Inches	Price, Per Lineal Foot	Elbows	Tees	Crosses	Valves
$\frac{1}{2}$	\$0.22	\$0.30	\$0.36	\$0.48	\$0.54
$\frac{3}{4}$	.24	.30	.36	.48	.54
1	.27	.30	.36	.48	.54
1 $\frac{1}{4}$	.30	.30	.36	.48	.54
1 $\frac{1}{2}$	.33	.30	.36	.48	.54
2	.36	.36	.42	.54	.60
2 $\frac{1}{2}$	.40	.42	.48	.60	.78
3	.45	.48	.54	.70	.96
3 $\frac{1}{2}$	.50	.54	.60	.80	1.20
4	.60	.60	.75	.90	1.50
4 $\frac{1}{2}$	.65	.72	.90	1.10	1.85
5	.70	.90	1.20	1.50	2.25
6	.80	1.30	1.60	2.00	2.80
7	1.00	1.80	2.20	2.80	3.60
8	1.10	2.40	3.00	3.60	4.40

When ordering, state whether for high, low, or medium pressure.

Moulded Rubber Goods

We carry a very extensive line of Moulded Rubber Goods for all mechanical purposes, such as bumpers, springs, rings, blocks, valves, etc. We are fully equipped to produce special goods in any grade of rubber, according to your requirements.

Rubber Mallets

No.	Length of Head, inches	Diam. at Center, inches	Diam. at Ends, inches
1	3 $\frac{1}{8}$	2 $\frac{5}{8}$	2 $\frac{1}{8}$
2	3 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$
3	4	2 $\frac{7}{8}$	2 $\frac{3}{8}$
4	4 $\frac{7}{8}$	3 $\frac{1}{4}$	2 $\frac{1}{2}$

**Corrugated Matting**

Corrugated matting is used extensively for runners in offices, stores, stairways, power houses and engine rooms; also used in short pieces as mats. We carry but one quality which is constructed to stand hard service. Made $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ inch thick and any length desired.

Perforated Rubber Mats

These mats are used almost universally in entrances to buildings and in elevators on account of their durability and cleanliness. We can furnish mats any size, shape or thickness, and have a name, monogram or trade mark shown if desired. In ordering odd size mats it is best to send with the order a paper pattern cut to size and shape. Large mats should be made in sections.

Lettering Extra. Red or White Letters



Rubber Diaphragms

Rubber diaphragms are usually put to very hard work. Our diaphragms are especially compounded for us with the idea of giving the best kind of service when put into use.



Channon's and Loud's diaphragms are exactly the same and fit the same pumps, but the Edson diaphragms are a little different and will not fit the same pumps as the Loud's or Channon's.

Twentieth Century Discs

Made to fit Jenkins valves. These discs are especially adapted to high pressure work, and will outlast any other style of rubber disc; will not break or squeeze out.



Size, Inches	Price Each	Size, Inches	Price Each	Size, Inches	Price Each
1/4	\$0.03	1	\$0.06	2 1/4	\$0.24
3/8	.04	1 1/4	.09	3	.33
1/2	.04	1 1/2	.12	4	.52
3/4	.05	2	.18	6	.90

Sheave Filling



We carry 21 different shapes in stock. When ordering it is best to send a small sample of the shape and kind wanted.

Pump Valves

We can furnish any kind of valves required and for any service. We need to know the diameter of the valve, the thickness of the valve, and the size of the hole through it. Make all measurements exact. Also state the kind of liquid, and whether hot or cold.



Soft Valves

These valves are for use in cold water only. They are soft, with a perfectly smooth surface, and will stand a moderate pressure.

Medium Hard Valves

We sell several grades of these for semi-hot water. They will be found very durable, and can be used where considerable pressure exists.

Hard Valves

These valves are made to stand a very high temperature. Being compounded both hard and tough, they will last a long time and stand a great pressure.

Leather Cups

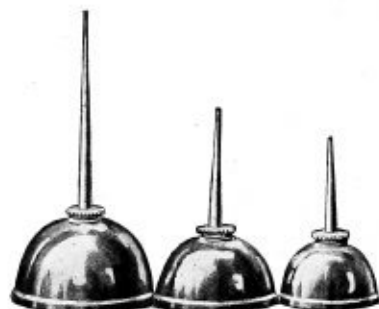


We are prepared to make all sizes, kinds and shapes of cups, flange leathers and washers.

Valve Cups		Piston Cups	
Size, Inches	Price, Each	Size, Inches	Price, Each
1	\$0.32	7 1/4	\$3.72
1 1/2	.32	8 1/4	4.60
2	.40	9 1/4	5.04
2 1/2	.46	10 1/4	5.30
3	.52	12 1/4	5.72
3 1/2	.54	14 1/4	6.30
4	.62	16	6.80
5	.80	18	7.20
6	1.20	20	8.30
7 1/4	1.60	.....	.....
8 1/4	2.20	.....	.....

STEEL AND BRASS OILERS

Made from 20 gauge stock; high grade clock spring steel bottom; heavily copper plated inside and out. Spout connections turned from solid brass with cut threads.



COPPER PLATED			BRASS			Diameter inches	Length Spout, inches	Capacity, pints
No.	Each	Per Dozen	No.	Each	Per Doz.			
12	\$0.45	\$ 4.50	120	\$0.65	\$ 6.50	2 3/4	2 1/2	1/4
13	.55	5.50	130	.80	8.00	3 3/8	3	1/4
13A	.60	6.00	130A	.90	8.75	3 3/8	5	1/4
14	.65	6.50	140	.95	9.20	3 3/8	9	1/4
14A	.75	7.50	140A	1.05	10.20	3 3/4	3	1/2
14AA	.80	8.00	140AA	1.10	10.75	3 3/4	5	1/2
14B	.85	8.50	140B	1.15	11.20	3 3/4	9	1/2
15	.95	9.25	150	1.20	12.00	4 1/4	3	1
15A	1.00	9.75	150A	1.30	13.00	4 1/4	5	1
16	1.05	10.50	160	1.40	14.00	4 1/4	9	1

ACME MACHINISTS' OILERS

Copper-Plated Steel

Dome pattern, seamless body, double seamed bottom, brass collar finely finished and large filler opening.



No.	Diameter Body, inches	Length Spout, inches	Capacity, pints	Price Each	Price Per Dozen
745	2 1/4	3 1/8	1/4	\$0.20	\$2.00
746	3 1/4	4 1/8	1/2	.25	2.25
746A	3 1/4	9	1/2	.30	2.60
747	4 1/8	5 1/8	1	.30	2.65
747A	4 1/8	9	1	.30	3.00

ZINC OILERS
Double Seamed Bottoms

No.	Diameter Body, inches	Length Spout, inches	Price Each	Price Per Dozen
00	2 1/8	1 1/2	\$0.10	\$1.00
0	2 1/8	1 1/2	.15	1.25
1	2 1/8	2	.15	1.50
1 1/2	2 1/8	2	.20	1.75
2	2 1/8	3	.20	2.00
3	2 1/8	4	.25	2.25
4	2 1/8	5	.30	2.75
5	2 1/8	5	.35	3.50
6	2 1/8	5	.45	4.50

MALLEABLE IRON OILERS



No.	Diameter Body, inches	Length Spout, inches	Price Each	Price Dozen	EXTRA SPOUTS	
					Each	Dozen
1	3 1/4	3	\$0.35	\$3.60	\$0.20	\$2.00
2	3 3/8	3	.40	4.00	.20	2.00
3	3 7/8	3	.45	4.40	.20	2.00

WALL'S BRAZED STEEL BENCH OILER

Brazed or soldered with hard solder; has steel spring bottom brazed to drop forged steel body. Spout is steel, case hardened at point and has large opening at body. Spout and body are polished; solid cut-brass bushing. Also furnished in nickel and brass finish.



Number	Diameter Body, inches	Length Spout, inches	Capacity, Pints	Price Each	Price per Dozen
204	3 $\frac{1}{8}$	4	$\frac{1}{2}$	\$0.50	\$5.00
304	3 $\frac{1}{4}$	4	$\frac{1}{2}$	.60	6.00
306	3 $\frac{1}{4}$	6	$\frac{1}{2}$	.65	6.50
309	3 $\frac{1}{4}$	9	$\frac{1}{2}$	.70	7.00
404	4 $\frac{1}{8}$	4	$\frac{3}{4}$	.70	7.00
406	4 $\frac{1}{8}$	6	$\frac{3}{4}$	.75	7.50
409	4 $\frac{1}{8}$	9	$\frac{3}{4}$	.80	8.00
504	4 $\frac{1}{8}$	4	1	.80	8.00
506	4 $\frac{1}{8}$	6	1	.85	8.50
509	4 $\frac{1}{8}$	9	1	.90	9.00

Extra Spouts

Length Spouts, inches	Price Each	Price per Dozen
2 $\frac{1}{2}$	\$0.15	\$1.50
4.....	.20	2.00
6.....	.25	2.50
9.....	.30	3.00
12.....	.35	3.50

4, 6, 9, 12-inch spouts are interchangeable. Spouts 6 inches and larger sent bent unless otherwise specified.

BRAZED STEEL PYRAMID OILER

Made of heavy steel all brazed with hard solder. Has vent which controls flow of oil. Pyramid construction.



No.	Length Spout, inches	Capacity, Pints	Price Each	Price Dozen
30	8	1	\$0.90	\$ 9.00
31	10	2	1.00	10.00
32	12	4	1.20	12.00

Extra Spouts

Length, inches	Price Each	Price Dozen
8.....	\$0.30	\$2.75
10.....	.30	3.00
12.....	.35	3.25
18.....	.35	3.50

Furnished straight unless otherwise specified. All sizes of each style interchangeable.

BRAZED STEEL LOCOMOTIVE OILER

Made entirely of steel. Every joint brazed with hard spelter.



No.	Diam. Body, in.	Length Spout, in.	Capacity, Pints	Price Each	Price Dozen
164	4 $\frac{1}{2}$	12	2	\$1.70	\$17.00
166	4 $\frac{1}{2}$	23	2	1.80	18.00

Extra Spouts

Length, inches	Price Each	Price Dozen
12.....	\$0.30	\$3.00
23.....	.55	5.50

All 12-inch spouts furnished straight, and 23-inch bent unless otherwise specified.

H.Channon Company. Chicago.

RAILROAD OR LONG SPOUT OILERS

Coppered Steel Railroad Oilers

Drawn seamless in two parts from 20 gauge cold rolled steel, heavily copper plated inside and out; highly polished solid brass spout connection with cut threads so that spout can be pointed in any direction.



No.	Diameter Body, inches	Height Body, inches	Length Spout, inches	Capacity, pints	PRICE		EXTRA SPOUTS	
					Each	Dozen	Each	Dozen
10	3 3/8	5	12	1	\$1.40	\$14.00	\$0.60	\$5.75
11	4 1/8	6	18	2	1.80	18.00	.70	7.00
101	4 1/8	6	12	2	1.80	18.00	.70	7.00
111	5	8	10 or 14	4	2.00	20.00	.90	9.00

BRASS RAILROAD OILERS

Made of brass, highly polished and lacquered; same construction throughout as the coppered steel.

No.	Diameter Body, inches	Height Body, inches	Length Spout, inches	Capacity, pints	PRICE		EXTRA SPOUTS	
					Each	Dozen	Each	Dozen
17	3 3/8	5	12	1	\$1.80	\$18.00	\$0.65	\$6.25
18	4 1/8	6	18	2	2.10	21.00	.75	7.50
18A	5	8	10 or 14	4	2.40	24.00		

THE HOWLAND PUMP OILER

Especially designed for machinery oiling, overhead bearings and all places not easily reached with a common oiler.

DIMENSIONS

Diameter Body, inches	Length Spout, inches	Capacity, pints
3	6	1/2
3	10	1
4	12	1 1/2
4	16	2

PRICES

TIN			COPPER PLATED			BRASS		
No.	Each	Dozen	No.	Each	Dozen	No.	Each	Dozen
300	\$1.69	\$15.25	400	\$2.30	\$23.15	500	\$2.70	\$26.80
3-2	1.75	17.50	402	2.60	25.75	502	3.05	30.50
303	2.20	21.75	403	3.00	30.35	503	3.50	34.75
305	2.45	24.25	405	3.30	32.75	505	3.95	39.25

PRICES EXTRA SPOUTS

Length, inches	TIN		COPPER		BRASS	
	Each	Dozen	Each	Dozen	Each	Dozen
6	\$0.39	\$2.80	\$0.30	\$3.15	\$0.65	\$6.30
10	.35	3.40	.45	4.40	.75	7.30
12	.45	4.30	.55	5.30	.80	7.90
16	.50	4.80	.60	5.65	.85	8.40

Prices on Spouts do not include Nut.

Pump mechanism being always in the oil never loses its priming, while location of plunger is most convenient, being directly under thumb, working with a downward pressure.

Spout connection made by means of a union which enables user to point spout in any direction, and also makes all spouts interchangeable.



ENGINEERS' TIN OILERS



No.	Capacity, pints	Length Spout, inches	Price Each	Price Per Dozen
A	1	7	\$0.35	\$3.75
B	2	7	.45	4.50
C	2	18	.60	6.00

STEEL AND BRASS TALLOW POTS



Drawn seamless from extra heavy cold rolled steel. Spouts have large openings.

Coppered Steel

No.	Capacity, quarts	Diameter Body, inches	Height Body, inches	Price Each	Price per Dozen
212	1	5	5	\$2.10	\$21.00
213	2	6	6	2.50	25.00

Brass

No.	Capacity, quarts	Diameter Body, inches	Height Body, inches	Price Each	Price per Dozen
214	1	5	5	\$3.20	\$32.00
215	2	6	6	3.60	36.00

INSPECTORS' AND LOCOMOTIVE TORCHES

Cold rolled steel, heavily copper plated inside and out; highly polished.

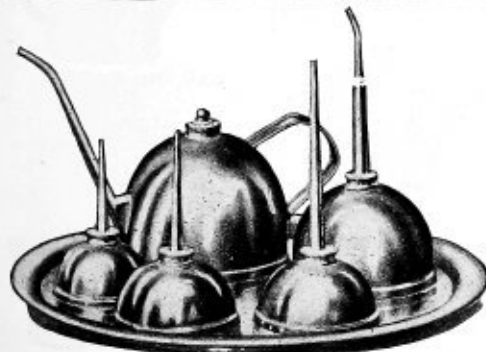


Nos. 27 and 28



No. 26

No.	Diameter Body, inches	Height, inches	Capacity, pints	Price Each	Price per Dozen
26	2	15	1	\$1.20	\$12.00
27	4 1/4	4 1/2	1 1/2	1.20	12.00
28	5 1/4	4 1/2	2 1/4	1.50	15.00



STEEL AND BRASS ENGINEERS' FILLERS



Drawn seamless of heavy steel. Highly polished. Spouts have large openings.

Coppered Steel

No.	Capacity, pints	Diameter Body, inches	Price Each	Price per Dozen
19	1	4 1/8	\$1.40	\$14.00
19A	1 1/2	4 3/4	1.70	17.00
210	2	5	2.00	20.00
211	4	6	2.40	24.00

Brass

No.	Capacity, pints	Diameter Body, inches	Price Each	Price per Dozen
190	1 1/2	4 3/4	\$2.20	\$22.00
200	2	5	3.00	30.00
201	4	6	3.40	34.00

STEEL JACKET LAMPS

Burn any kind of oil. Made of cold rolled steel, drawn seamless in one piece—heavily copper plated throughout—always furnished with round burners—will not leak.



No. 20



No. 22

No.	Diam., inches	Style	Capacity	Price Each	Price per Dozen
20	3 3/4	Cut No. 20	5 oz.	\$0.60	\$ 6.00
20 1/2	3 3/4	"	1/2 pint	.90	9.00
21	4 1/8	"	1 1/2 pints	1.20	12.00
22	3 3/4	"	22 1 pint	.90	9.00
23	4	"	1 1/2 pints	1.20	12.00
24	4 7/8	"	1 quart	1.50	15.00

STEEL AND BRASS ENGINEERS' SETS

Coppered Steel

No.	Number Pieces	Style Tray	Price per Set
C30	5	Round	\$ 5.00
C40	6	"	7.00
C35	5	Oval	7.00
C45	6	"	10.00

Brass

No.	Number Pieces	Style Tray	Price per Set
30	5	Round	\$ 6.00
40	6	"	9.00
50	5	Oval	8.00
60	6	"	11.00



Pyramid Screw Top

BRAZED STEEL TORCHES

Heavy drop forged steel body; pyramid construction; bottom plain steel of the finest grade, brazed in; spout is solid steel, bored out. Largely used in foundries, machine shops, rolling mills, blast furnaces, mines, etc.



Top Burner

SCREW TOP

No.	Style	Capacity, pints	Price Each	Price per Dozen
81	1 Burner	1	\$0.90	\$ 9.00
82	1 "	2	1.00	10.00
84	1 "	4	1.20	12.00
86	2 "	8	1.50	15.00

TOP BURNER

No.	Capacity, pints	Price Each	Price per Dozen
181	1	\$0.90	\$ 9.00
182	2	1.00	10.00

BRAZED STEEL ENGINEER'S TORCH



Made entirely of steel; bottom brazed in; high quality; extra strong and durable. For the locomotive or stationary engineer.

No.	Price Each	Price per Dozen
110	\$0.90	\$9.00

STEEL BRAZED BOILER INSPECTOR'S TORCH



No.	Length Body, in.	Height, inches	Width, inches	Price Each	Price per Dozen
122	5	1 1/2	2 3/4	\$0.90	\$9.00

Furnished with burner as shown, or spout as indicated by dotted line.

TALLOW POTS

Steel, copper bottom, 2 quart capacity.
Per dozen.....\$10.50



CAR OIL CANS

10 quart box oiler, galvanized iron. Per dozen.....\$11.00
4 quart, straight spout, iron. Per doz.....\$9.50
4 quart, tin top, iron. Per doz.....\$7.00



DOPE PAILS

Galvanized iron, 10 quarts, with lip. Per doz.....\$12.50
Galvanized iron, 10 quart, with spout. Per doz.....\$16.00



WALTON OIL TANKS



Made of heavy galvanized steel, with wood bottom reinforcing the metal bottom, nicely painted and stenciled.

Capacity, Gallons	Net Weight, Pounds	Price Each
30	35	\$ 9.20
60	50	10.40
110	65	17.00
165	85	25.00

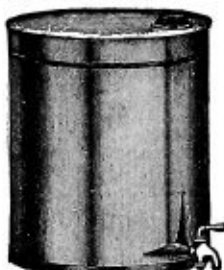
Fitted with either force or lift pump, as desired.

GASOLINE TANKS

For Gasoline, Turpentine and Light Oils

Made of Nos. 26 and 24 galvanized iron, with wood bottoms beneath metal ones. Perfectly air tight, opening in top being securely covered with a 4-inch can screw.

Have a ground brass faucet for drawing off the contents.



Capacity, Gallons	Diameter, inches	Height, inches	Weight, lbs.	Price Each
30	22	24	30	\$ 9.00
60	25	28	40	11.00
110	30	36	60	15.00
165	37	36	80	23.00
215	37	48	125	29.50

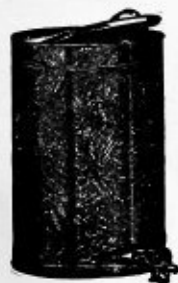
Fitted with either force or lift pump, as desired.

VARNISH TANKS

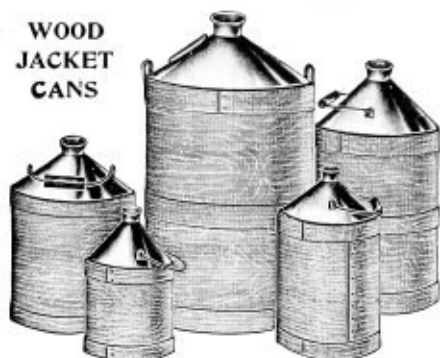
For Heavy Oils and Varnishes

Made of 26 gauge galvanized iron with hinged cover and 1 1/4 inch Perfection gate.

Capacity, Gallons	Diameter, inches	Weight, lbs.	Height, inches	Price Each
30	23	30	25	\$11.00
60	24	40	25	12.00
110	30	60	36	19.00



WOOD JACKET CANS



Capacity, Gallons	Price Each	
	With Spout	Without Spout
1	\$0.55	\$0.45
2	.70	.55
3	.85	.70
5	1.00	.85
10		1.50

TIN OIL OR TRANSFER PUMPS

No.	Diam., inches	Length Stock, inches	Price Each
1	1 1/4	32	\$2.50
2	1 1/2	54	6.00
3	1 3/4	78	7.00



OIL GATES

For Handling Heavy or Thick Liquids, Japanned Iron, Screw Shank



STEBBINS'

PERFECTION

No.	Size, inches	Price Each	Price per Doz.	Size, inches	Price Each	Price per Doz.
1	1	\$0.70	\$ 7.00	3/4	\$1.20	\$12.00
2	1 1/4	.80	8.00	1	1.40	14.00
3	1 1/2	.90	9.00	1 1/4	1.65	16.50
4	1 3/4	1.00	10.00	1 1/2	2.00	20.00
5	2	1.20	12.00	2	2.80	28.00

PETROLEUM FAUCETS

Japanned Iron, Brass Lined, Brass Key, Lever Handle, Screw Shank

For handling kerosene, gasoline and other light oils or liquids.



No.	Size, inches	Price Each	Price, per Doz.
1	1/2	\$1.10	\$11.00
2	3/4	1.30	13.00
3	1	1.60	16.00
4	1 1/4	2.30	23.00

GALVANIZED WASTE CANS



"Standard"



"Justrite"

Corrugated Iron
CansAsh and Waste
Cans

"Standard." For oily rags and waste; made of 26 gauge Galvanized iron with self-closing, tight-hinged cover to conform to the requirements of the National Board of Fire Underwriters.

"Justrite." Has foot lever making opening of cover so convenient that it obviates any desire to block lid open. Constructed, examined and tested to insure the measure of safety prescribed by the National Board of Fire Underwriters.

"Corrugated." Heavy galvanized corrugated iron waste cans with gravity closing lid; conforming to the specifications of the National Board of Fire Underwriters.

Galvanized Ash and Waste Cans. Made of galvanized sheets bound with heavy band iron and detachable cover.

"STANDARD"

No.	Diameter, inches	Height, inches	Weight, pounds	Price Each
2	12	18	15	\$1.80

"JUSTRITE"

No.	Diameter, inches	Height, inches	Weight, pounds	Price Each
1	11 $\frac{3}{4}$	13	8	\$2.10
2	12 $\frac{1}{2}$	14	9	2.70
3	13 $\frac{1}{2}$	15	10	3.30

CORRUGATED WASTE CANS

No.	Diameter, inches	Height, inches	Price Each
1	15	17	\$3.60
3	15	27	5.40
4	17	17	4.50
6	17	27	6.30

ASH AND WASTE CANS

No.	Diameter, inches	Height, inches	Capacity, bushels	Price Each
2	13 $\frac{3}{4}$	19 $\frac{1}{4}$	1 $\frac{1}{2}$	\$5.50
3	17 $\frac{1}{2}$	24	2 $\frac{1}{2}$	7.00
4	20	28	3 $\frac{1}{2}$	9.00

GALVANIZED STEEL BASKETS
With Double Bottom and Rope Handles

No.	Capacity, Bushels	Diam., inches	Depth, inches	Weight each, lbs.	Price Each	Price Dozen
1	1	17	11 $\frac{1}{2}$	6	\$1.80	\$18.00
1 $\frac{1}{2}$	1 $\frac{1}{2}$	19	13	7	2.25	22.50
2	2	20	16	8	2.70	27.00
3	3	23	17	10	3.60	36.00

BAMBOO COAL BASKETS
Nailed Rims, Iron Strapped, Extra Strong

No.	Capacity, bushels	Diameter, inches	Depth, inches	Weight, pounds	Price Each
10	1	17 $\frac{1}{2}$	12 $\frac{1}{2}$	5 $\frac{1}{2}$	\$1.90
15	1 $\frac{1}{2}$	19	14	6 $\frac{1}{2}$	2.30
20	2	21	15	7 $\frac{1}{2}$	2.60

PRESSED STEEL SHOP PANS



The pressed steel pan, as the name implies, is pressed from flat sheets of steel; usually 16 gauge is used, but we can make to order from whatever thickness required.

The pan is not riveted in any way, therefore will not leak.

For use in machine shops, bolt works, etc., under lathes and drill presses to catch trimmings, borings and oil drippings.

Size	Width, Inches	Length, Inches	Depth, Inches	Weight, Lbs.	Price Each
A	15	23	3 1/2	9	\$1.60
C	17	35	3 1/2	16	2.30
F	19	39	3 1/2	19	2.60
G	8 1/4	24	2 1/2	4 1/2	1.75
H	13 3/4	21 1/2	5 3/4	9	2.75
J	8 3/4	16 1/2	5 1/4	6	2.00

H and J are made with or without handles. We furnish with handles unless otherwise specified.

STEEL TOTE BOXES



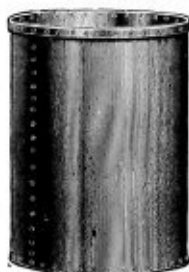
Made of 16 gauge steel with riveted lapped corners. Riveted handles. Half inch lap on upper edge of side which strengthens the box and gives a smooth finish. The flat bottom and strengthened corners allow piling ten or twelve deep without danger of "buckling." Designed for handling bolts, rivets, nuts, small castings, etc.

Weight, complete, 8 lbs.

Price \$2.50 each.

Other sizes on application.

ALL STEEL BARRELS



For foundries, brass works, machine shops and factories; designed for carting heavy fitting, casting, etc. Made of 16 gauge steel having only one riveted seam. Bottom stamped from single plate No. 14 gauge steel to form flange one inch deep which is riveted to shell and has one inch corrugation six inches from center.

Weight, 50 lbs. each. Price \$10.00 each.

Other sizes on application.

SALAMANDERS

Heavy Steel Pan, Body and Legs

Cast Iron Grates



Gauge Iron, No.	Diameter Body, inches	Height Body, inches	Price Grates, Each	Price Complete, Each
16	16 1/4	11 1/4	\$0.75	\$3.50
18	16 1/4	11 1/4	.75	3.00
20	16 1/4	11 1/4	.75	2.60
21	16 1/4	11 1/4	.75	2.50

GALVANIZED STEEL HOISTING BUCKETS

Wrought Iron Bail and Reinforcement

Double Riveted Bottom



No.	Size, inches	Price Each
201	15 x 17	\$ 8.00
203	15 x 27	10.50
206	17 x 17	9.00
208	17 x 27	12.00
213	20 x 27	13.50
215	25 x 24	15.00

BABBITT METALS



WHAT ONOKO IS

Onoko Babbitt Metal is an alloy of metals possessing the requisite hardness and anti-friction qualities to make it a satisfactory substitute for the high-priced bronze and tin compositions or so-called "Genuine Babbitt." The anti-friction and wearing qualities of **Onoko Babbitt Metal** are fully equal to the high-priced metals, although its hardness may be somewhat less. The high-priced metals, on the other hand, besides possessing a hardness much greater than is really needed in actual practice, have the comparative disadvantage of being far more expensive than **Onoko** while no better in the most essential and vital qualities. In other words, when you buy a babbitt metal which costs more than twice as much as **Onoko**, you get nothing for this additional outlay except a somewhat harder and stiffer metal which is really unnecessary in actual practice.

HOW ONOKO IS MADE

Onoko Babbitt Metal is in every sense a proper and scientific alloy. It is made to an exact formula, consequently its composition is absolutely definite and unvarying. The different ingredients are carefully selected and tested with regard to their wearing and anti-friction qualifications. It is alloyed by the most expert metal mixers directly under the supervision of a chemical engineer, whose duty it is to select and test each ingredient to see that each is added at exactly the proper temperature—that the quantities are accurately weighed and that the whole is alloyed and blended into the perfect finished metal. The careful and scientific manner in which each ingredient is selected and tested and the exact formula which is rigidly followed in every detail of manufacture, results in an absolutely uniform alloy far superior to the many so-called bearing metals of nondescript character offered to consumers at various prices.

WHAT ONOKO WILL DO

Primarily, **Onoko Babbitt Metal** is intended for general use on machinery bearings in mills, factories, steamships, railroads, etc. On high speed engines, dynamos and under heavy crushing loads, such as rolling mills, saw and wire mills, etc., many tests have proven its superiority. In railroad service, as a liner for car journal bearings, driving axle bearings, etc., the unusual satisfaction obtained has resulted in the adoption of **Onoko** for this service by many of the leading railroads of the country. It runs uniform, smooth and cool. It is equally adapted for high or low speeds and on all classes of transmission machinery it is the best and most economical babbitt metal that can be used. Its low coefficient of friction effects a great saving in oil and permits the use of a much cheaper grade of lubricant. By increasing the motive power **Onoko Babbitt Metal** adds to the efficiency of any machinery on which it is used.

We will be glad to send results of recent tests and will appreciate an opportunity to figure on your requirements.

In 28 lb. boxes	per lb., \$0.25
" 56 " "	" " .25
" 112 " "	" " .25

BABBITT METALS



Nickel Babbitt.....	per pound, \$0.35
Pure Genuine Babbitt.....	" .32
No. 1 Babbitt.....	" .12
No. 2 Babbitt.....	" .10
No. 3 Babbitt.....	" .09
No. 4 Babbitt.....	" .07
Globe Box Metal.....	" .26
Wing's High Speed Metal.....	" .20

ALUMINUM COPPER ANTI-FRICTION METAL

Extra Grade.....	per pound, \$0.15
Genuine Grade.....	" .40

MAGNOLIA BABBITT METAL



Per pound.....\$0.30



Pigs weigh about 100 pounds. Market rates.

SHEET LEAD

Thick- ness, inches	Pounds, per square foot	Price, pound	Thick- ness, inches	Pounds, per square foot	Price, pound
$\frac{1}{8}$	2 $\frac{1}{2}$	Market	$\frac{1}{4}$	7	Market
$\frac{1}{16}$	3	"	$\frac{3}{8}$	8	"
$\frac{1}{32}$	3 $\frac{1}{2}$	"	$\frac{1}{2}$	9	"
$\frac{1}{64}$	4	"	$\frac{3}{4}$	10	"
$\frac{1}{128}$	4 $\frac{1}{2}$	"	$\frac{7}{8}$	11	"
$\frac{1}{256}$	5	"	1	12	"
$\frac{1}{512}$	6	"	...	...	"

Stock Rolls average 20 feet in length. From 7 feet to 9 feet 2 inches in width.

BLOCK TIN

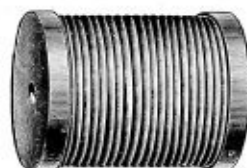


Pigs weigh about 100 pounds. Market rates.

Bars weigh about 1 $\frac{1}{2}$ pounds. Market rates.

Antimony, Antimonial Lead, Aluminum, Bismuth, Nickel, Spelter—Quoted upon application.

WIRE SOLDER



No. 10 ga. Half and Half Solder. Price on application.

INGOT COPPER

Market Rates



40-60 Solder. Market rates. Half and Half. Market rates.

BRAZING SPELTER OR SOLDER

Coarse, long grain.....	per pound, \$0.40
Fine, round grain.....	" .45

BRAZING COMPOUND OR FLUX

In 1, 5 and 10 Pound Boxes

1 pound boxes.....	per pound, \$0.30
5 and 10 pound boxes.....	" .25

BORAX

Refined and Powdered

Full barrels.....	per pound, \$0.08
Broken lots.....	" .10

BABBITT MELTING LADLES

Drop Forged of Extra Heavy Mild Steel



Diameter of Bowl, inches	Lead Capacity, pounds	PRICE	
		Each	Dozen
3	1½	\$0.35	\$ 3.50
4	4	.50	5.00
5	8½	.65	6.50
* 6	15	1.00	10.00
7	26	1.20	12.00
8	45	1.50	15.00
9	57	2.00	20.00
10	80	2.40	24.00
12	130	3.00	30.00

*Six inch ladle made extra heavy.

SOLDER AND POURING POTS



Solder Pot



Pouring Pot

Solder Pots

Size, inches	Lead Capacity, lbs.	Price Each
5	12	\$0.40
6	16	.60
8	80	.90
10	100	1.65
12	130	2.75

Pouring Pots

Outside diameter, 8 inches. Inside diameter, 7 inches. Depth, 6 inches.

Price each.....\$2.50

FOUNDRY LADLES

HAND LADLES COMPLETE WITH SHANKS
Handles Are Hollow and
Furnished With Ring



No. 122. Flat Bottom Welded Steel Bowl

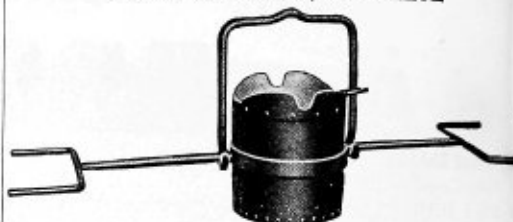
Capacity, pounds	Weight Each, lbs.	Price Each	Capacity, pounds	Weight Each, lbs.	Price Each
30	12	\$4.50	60	15	\$5.40
40	13	4.80	70	17	7.00
50	15	5.00	..	..	....

No. 126. FLAT BOTTOM, STEEL BOWL, BULL LADLE, COMPLETE WITH SHANK, ONE END STRAIGHT



Capacity, pounds	Weight Each, lbs.	Price Each	Capacity, pounds	Weight Each, lbs.	Price Each
100	55	\$10.70	500	125	\$20.50
150	60	11.90	800	160	27.50
250	80	14.25	1000	175	32.50
350	110	16.65	....	...	....

No. 128. STEEL BOWL, CRANE LADLE, WITH SHANK AND BAIL, COMPLETE



Capacity, pounds	Approx. Weight Each, pounds	Price Each	Capacity, pounds	Approx. Weight Each, pounds	Price Each
400	115	\$27.00	1000	190	\$39.00
600	150	30.50	1200	220	44.50
800	170	35.00	1500	270	52.00

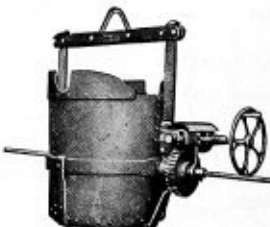
No. 142. FOUR-WHEELED BUGGY LADLE, NOT GEARED, DOUBLE END SHANK

This Ladle May Be Lifted Free From Buggy by Use of Crane Bail



Capacity, pounds	Approx. Weight Each, pounds	Price Each	Capacity, pounds	Approx. Weight Each, pounds	Price Each
1000	550	\$ 82.50	3000	900	\$125.00
1500	650	97.50	4000	1150	150.00
2000	750	112.50	....	....	....

Ladles less than 2,000 lbs. capacity made without basket. Ladles 2,000 lbs. capacity and over made with basket. Always give gauge of track and minimum height above track.



No. 150. GEARED CRANE LADLE

Capacity, pounds	Approx. Weight Each, pounds	Price Each	Capacity, pounds	Approx. Weight Each, pounds	Price Each
1000	375	\$ 75.00	8000	1300	\$260.00
2000	525	104.00	10000	1900	332.50
3000	725	145.00	12000	2100	367.50
5000	925	195.00	16000	2800	420.00

Ladles less than 2,000 lbs. capacity made without basket. Ladles 2,000 lbs. capacity and over made with basket. In sizes above 8,000 lbs. capacity bail is made with channel cross-bars.

THE TURNER DOUBLE JET BRAZING FORGES

FOR GASOLINE

Nos. 55, 85 and 105

The burners may be turned low, like a lamp, when not in use, and with a single turn of the valves bring on full heat. The head is equipped with fire-brick, which increases and retains the heat. The tank is made of boiler steel, galvanized, and every one is tested to 150 pounds. The best working pressure for brazing is 25 to 50 pounds. Use 74-degree gasoline.



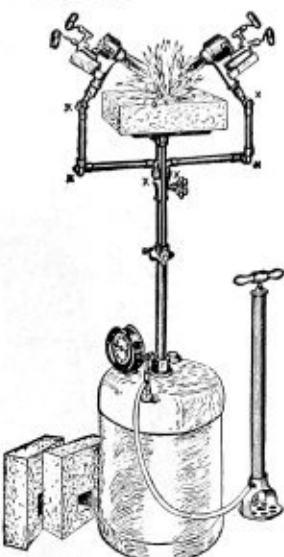
No. 85 Brazing Forge and No. 530 Floor Pump

	No. 55	No. 85	No. 105
Capacity of Tank.....	5 gallons	8 gallons	10 gallons
Height over all.....	48 inches	46 inches	49½ inches
Diameter of Tank.....	9 inches	12 inches	12 inches
Net Weight.....	62 pounds	70 pounds	72 pounds
Shipping Weight.....	74 pounds	84 pounds	86 pounds
Price (without pump)....	\$27.00	\$30.00	\$35.00
Consumption of Fuel.....	3½ pints per hour		

No. 530 Floor Pump, \$4.50

No. 88 Adjustable

The two special large **Double Jet** burners with which this forge is fitted throw out intensely hot flames of great volume and power, and are so swiveled at points marked "X" that they may, at the will of the operator, be swung around in any position. The table supporting the fire bricks is also adjustable so that it may be raised or lowered independent of the burners. The tank is made of boiler steel, well brazed and heavily galvanized. Each one is tested to 150 pounds pressure. The best working pressure for brazing is from 25 to 50 pounds. Used 74-degree gasoline.



No. 88 Brazing Forge and No. 530 Floor Pump

Capacity of Tank.....	eight gallons
Height over all.....	48 inches
Diameter of Tank.....	12 inches
Net Weight.....	78 pounds
Shipping Weight.....	95 pounds
Consumption of Fuel.....	3½ pints per hour
Price each (without pump).....	\$37.50

No. 530 Floor Pump, \$4.50

CRUCIBLES

Plumbago or Graphite



Sizes and prices quoted upon application.

COPPER HATCHET BOLTS



Price per pound.....Market

SOLDERING COPPERS



3 pounds to pair and larger.....	Base
2½ " "	advance per lb. \$0.01
2 " "	" " " .02
1½ " "	" " " .03
1 " "	" " " .06

SOLDERING COPPER HANDLES

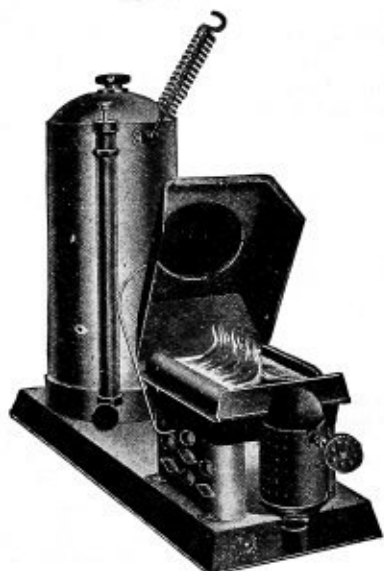


Made of soft wood, well wired.

Per Dozen.....	\$0.25
Per Gross.....	2.50

GAS SOLDERING FURNACES

THE LUNDY



Heats the Irons Rapidly, with a Very Low Consumption of Gasoline

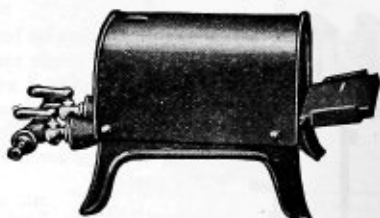
The blast is from the outside to the center, so that when one soldering copper is being used, both hot blasts are forced upon the one remaining.

Can be readily carried about on roofs or any place where a soldering furnace is used.

Tank is galvanized steel, 5 x 12 inches, with 1 x 10 inch brass pump. Furnace will heat two 12-lb. coppers at one time.

Price, each\$10.00

THE SUPERIOR



For Natural Illuminated or Produced Gas

Burns about 92% of air and 8% of gas.

The fire brick keeps the heat from radiating.

Maximum capacity is four large size coppers at a time, but gives better service with only two.

	Size	Price Each
No. 1.	Single Burner, with Cast Iron Top....	\$3.00
No. 2.	Double Burner, with Cast Iron Top....	4.00
No. 3.	Single Burner, with Firebrick.....	4.00
No. 4.	Double Burner, with Firebrick.....	5.00

GAS HEATER FOR SOLDERING COPPERS

An Efficient Heater, Low in Price and Durable in Construction.



Price, each.....\$1.25

GASOLINE FIRE POTS

For Tanners, Galvanized Iron and Copper Workers, Plumbers and Electricians



No. 1—1 Gallon Capacity

Will heat a jobbing pot of metal in 4 or 5 minutes. It is arranged to heat soldering coppers at the same time. No wind is heavy enough to extinguish the flame. Weight, 14 lbs.

Price, with Galvanized Iron Tank\$12.00

No. 5—Three Quart Capacity

No. 5 Pot is the same as No. 1, except about two-thirds the size, especially designed to be taken out on jobs. The top section can be removed, exposing the open fire, which may be used as a torch or brazing fire. Weight, 12 lbs.

Price, with Galvanized Iron Tank, each\$9.00

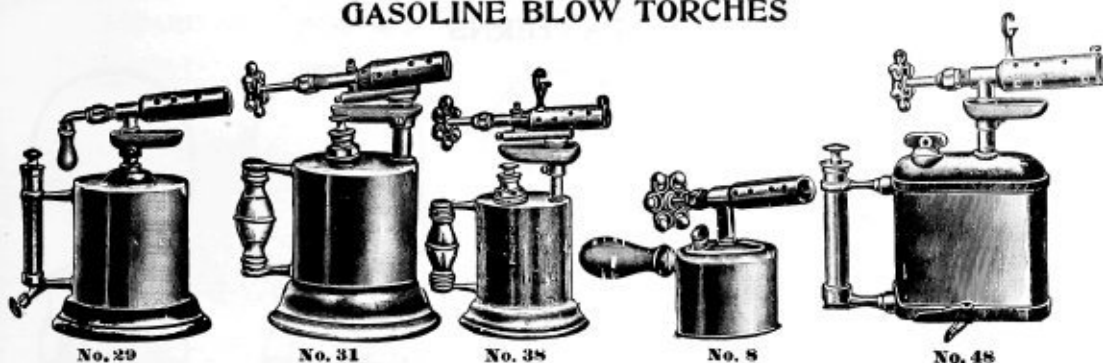
No. 10—COIL FIRE POT

The tank is made of heavy galvanized iron, fitted with a galvanized cast iron bottom ring which protects the bottom from wear or bruises. The top is made of galvanized cast iron, and all small or light castings are malleable iron, which makes them light and strong. The coil is made of extra heavy pipe, and the burner of steel, prepared especially for this work. The valves are fitted with needle points. Weight, 13 lbs.



Price, each.....\$6.00

GASOLINE BLOW TORCHES



No. 29—Fitted with brass air pump, forming part of the handle. Burner is fitted with quick-acting double-shouldered needle point.

No. 30—Same as No. 29, with hook and support for holding soldering coppers.

No. 31—For heavy outdoor work. A brass air pump screws into tank and is submerged in the gasoline.

No. 32—Same as No. 31, with hook and support for holding soldering coppers.

No. 37—For outdoor work. Not affected by wind or zero weather.

No. 38—Same as No. 37, with hook and support for holding soldering coppers.

No. 8—Will stand enormous pressure; heat generates air pressure; has adjustable handle and can be held in any position.

No. 48—Oblong body, $1\frac{7}{8}$ " x 5" long, 8" high over all. Has hinged supports to prevent tipping over.

Number	Capacity, pints	Shipping Weight, pounds	Price Each
29	2	$4\frac{1}{2}$	\$3.25
30	2	$4\frac{3}{4}$	3.50
31	2	5	3.75
32	2	5	4.00
37	1	$3\frac{1}{2}$	3.25
38	1	$3\frac{3}{4}$	3.50
8	$\frac{1}{2}$	2	3.00
48	1	$5\frac{1}{4}$	4.00

No. 14 POCKET TORCH

For Gasoline or Alcohol



When blow tube is not used the Torch makes a fine candle. A hook is provided so that it may be hung up. $1\frac{3}{4}$ -inch diameter, $6\frac{1}{2}$ inches high.

Price each, brass \$2.00

Price each, nickel 2.20

GASOLINE TORCHES



A superior quality torch. Practical in operation and durable. Tank is of heavy tin and burners are heavy and of high quality.

Price per Dozen.....\$18.00

LANTERNS



Hot Blast



Cold Blast



No. 2 Mill

Railroad
with tin baseRailroad
with wire base

Hot Blast Tubular Lanterns, plain tin for indoor use. **No. 0** has 2-pieced tube, No. 1 burner, $\frac{5}{8}$ inch wick No. 0 globe locked burner, inside guard. **No. 2** has 2-pieced tube, No. 2 burner, 1 inch wick, No. 0 globe locked burner, inside guard. Same as No. 0 but made heavier and stronger.

Cold Blast Tubular Lanterns, plain tin, will not blow out, for general use, in-doors or out. No. 2, has 2 pieced tube, No. 2 burner, 1 inch wick, No. 0 cold blast globe.

No. 2 Cold Blast Tubular Mill Lantern, No. 2 burner, 1 inch "B" wick, No. 0 cold blast globe. Endorsed by insurance companies. Especially constructed to keep the dust out of the tubes, making it a safe mill lantern.

No. 39 Standard Railroad Lantern. For lard, sperm oil or kerosene. Made of annealed and tinned steel spring wire and highest quality open hearth coating tin. Furnished with either wire or tin bottoms.

HOT BLAST, COLD BLAST AND MILL LANTERNS

Number	Style	PRICE WITH WHITE GLOBES		WITH GREEN OR RUBY GLOBES	
		Each	Dozen	Each	Dozen
0	Hot Blast	\$0.65	\$ 6.25	.....	.....
2	Hot Blast	.85	8.50	.....	.....
2	Cold Blast	1.05	10.50	\$1.30	\$13.00
2 Mill	Cold Blast Mill	2.20	22.00	.....	.....

No. 39 STANDARD RAILROAD LANTERNS

Style	WHITE GLOBES		GREEN OR BLUE GLOBES		RUBY GLOBES	
	Each	Dozen	Each	Dozen	Each	Dozen
Tin Bottom	\$1.20	\$12.00	\$1.65	\$16.50	\$2.00	\$20.50
Wire Bottom	1.25	12.50	1.70	17.00	2.10	21.00

Railroad lanterns with extended outside wick lifter advance list.....Doz. \$0.50

LANTERN GLOBES



No. 0. Tubular

No. 0. Tubular
"Bull's Eye"

No. 39 R.R.

Globe No.	For Lanterns Suitable	WHITE		GREEN OR BLUE		RED	
		Each	Dozen	Each	Dozen	Each	Dozen
0	No. 0 & 2 Tubular	\$0.15	\$1.20	\$0.40	\$4.00	\$0.55	\$5.50
0	No. 18 & 2 Cold Blast	.10	.90	.35	3.50	.50	5.00
0	Bull's Eye	.20	1.92	.....	.....	.....	.....
29	No. 29 Cold Blast	.20	2.00	.40	4.00	.55	5.50
39	R. R. Standard	.15	1.50	.50	5.00	.65	6.50
39	R. R. Flint	.30	3.00	.80	8.00	1.20	12.00

SQUARE STATION LAMPS

For kerosene, fitted with silvered glass reflector, holds sufficient oil to burn for 20 hours.



No.	Glass, inches	Burner, No.	Wick, inches	Price Each
1	8 x 10	1	5/8	\$2.50
2	10 x 12	2	1	3.00
3	11 x 15 1/2	2	1	3.50

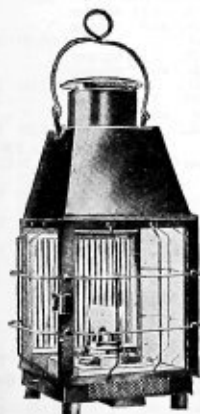
IMPROVED TUBULAR LAMPS

Cold Blast; no chimney; patent wind break; outside wick regulator, silvered glass reflector, cannot blow out.



No.	Height, inches	Width, inches	Wick, inches	Price Each
6	16 3/4	8 3/4	1 B	\$5.50
7	22 1/2	11 1/4	1 1/2 D	6.50
8	24 1/2	13 1/2	1 1/2 D	8.50

TUBULAR GOVERNMENT GUARDED SQUARE LAMP

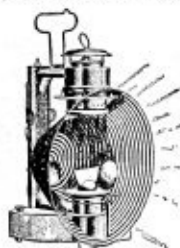


Constructed without tubes as on other tubular square lamps. This lamp is provided with an air shaft on the back which freely supplies the burner with air, giving a strong light unaffected by heavy winds. Made with 8 inch square silvered corrugated glass reflector. Packed one in a case.

Burner	Wick, inches	Weight, pounds	Price Each
No. 2 Hot Blast	1 B	9 1/4	\$8.50

No. 20 TIN TUBULAR "COLD BLAST" SEARCHLIGHT

Japanned finish; throws brilliant and steady light; will burn as well out of doors as inside without smoking or flickering; it is not affected by wind or strong drafts.



No.	REFLECTOR		Wick, inches	PRICE EACH	
	Diameter, inches	Deep, inches		Plain Globe	Bull's Eye
2	12	7	1	\$3.00	\$3.25



STANDARD HEADLIGHTS

[With Steel Bottoms]

Adapted for narrow gauge or traction engines, locomotives and inspection cars. Well made and thoroughly reliable.

Round

Figure	Reflector, Diameter, inches	Extreme Height, inches	Bottom Board, inches	Price Each
19	10	17 1/4	6 x 16	\$ 8.90
20	12	24 3/4	6 x 16	18.60
21	14	28	6 x 17 1/2	20.00

Square

48	10 Sq.	21	7 x 13	\$7.15
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REAR END TAIL LAMP

A standard lamp of best construction. For steam or street railways. Ruby semaphore lens. Burns oil. Will not blow out. Will not jar out.



Height, inches	Diameter, inches	Price Each
13 1/2	5 1/2	\$3.50

LE PAGE'S LIQUID GLUE



In Bottles



In Cans with Brush

IN BOTTLES, FOR FAMILY USE

Half gills, three dozen in case.....per dozen, \$1.50
Gills, three dozen in case.....2.00

CARRIAGE GLUE, IN TIN CANS

For Mechanics, Etc.

Half pint, two dozen in a case.....per dozen, \$3.00
One pint, one dozen in a case.....5.00
One quart, one dozen in a case.....9.00
Half gallon, one half dozen in a case.....17.00
One gallon, one half dozen in a case.....32.00
Five gallon cans, boxed.....per gallon, 2.60

GLUE POTS

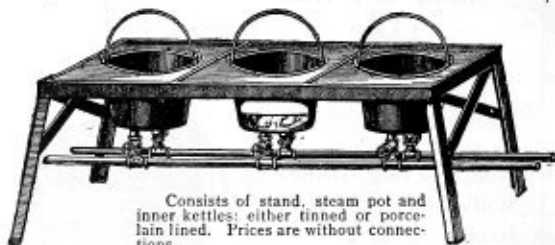
PRICE PER DOZEN



No.	Capacity, Cup	Capacity, Pot	Plain	Tinned or Lined
000	3 gills	1 1/2 pts.	\$4.25	\$5.00
00	1 pt.	3 "	4.75	5.50
0	1 1/4 "	3 "	5.00	6.00
1	1 1/2 "	3 "	6.00	6.75
2	2 "	3 1/2 "	7.50	8.40
3	2 1/2 "	4 "	9.00	10.26
4	3 "	4 1/2 "	11.50	12.42
5	3 1/2 "	5 "	13.50	14.58
6	4 "	6 "	15.00	16.94
7	4 1/2 "	7 "	17.50	20.00

"ACME" STEAM GLUE POTS AND STAND

For use for glue and paste in planing mills, book binderies, box factories, furniture manufacturers, refrigerator manufacturers, pattern-making establishments, carriage manufacturers, car shops, for printers' ink etc.

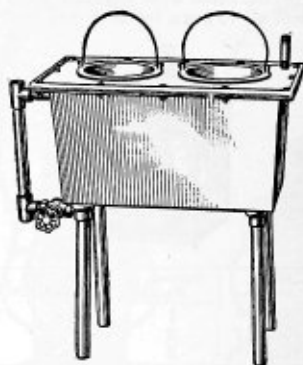


Consists of stand, steam pot and inner kettles: either tinned or porcelain lined. Prices are without connections.

No. 1, holding 1 pot, ea., \$14.25 No. 4, holding 4 pots, ea., \$48.00
" 2, " 24.75 " 5, " 58.50
" 3, " 37.50 " 6, " 70.50
Steam pots only, without frame or inside kettle.....7.90
Inside kettle only, holding 5 qt., tinned or porcelain lined 2.05

If plain inside kettles are wanted, deduct list each 80c.

GLUE HEATERS



In these heaters live steam is introduced directly into the water chamber, obtaining quick results from very little steam.

"BURLINGTON" GLUE HEATERS

Plain iron tank, japanned, size, 20 inches long, 11 inches wide, 9 inches deep.

No.	Number and Capacity of Cups	Lining	Price Each
1-P	{ Has one each 2 and 3 qt. cups	Plain iron	\$12.00
1-E		Porcelain	12.25
1-T	{ Has two 1 1/2 qt. and one 1 qt. cup	Tin	12.75
10-P		Plain iron	12.25
10-E		Porcelain	12.50
10-T		Tin	13.00

GLUE HEATER (Kerosene)

An indispensable tool for factories and shops. Made of heavy tin, wire re-inforcement in legs. Furnished with tin cup and tin pail or copper cup and copper pail.

Always order by number.

No.	1 pt. tin cup and tin pail.....	2 pt. tin cup and tin pail.....	3 pt. tin cup and tin pail.....	1 pt. copper cup and copper pail.....	2 pt. copper cup and copper pail.....	3 pt. copper cup and copper pail.....
	\$13.00	\$14.50	14.00	15.00	16.00	17.00
	1.45	1.55	1.65	1.75	1.85	1.95
No. 10, 1 pt. tin cup and tin pail.....	14.00	14.50	15.00	16.00	17.00	18.00
No. 20, 2 pt. tin cup and tin pail.....	14.00	14.50	15.00	16.00	17.00	18.00
No. 30, 3 pt. tin cup and tin pail.....	14.00	14.50	15.00	16.00	17.00	18.00
No. 1 No. 2 No. 3 Copper Cups, doz. \$4.00 \$4.50 \$5.00	each .45	each .55	each .65	each .75	each .85	each .95
" Pails, doz. 5.00 5.50 6.00	each .75	each .85	each .95	each 1.20	each 1.30	each 1.50
" Tin Cups, doz. 1.20 1.30 1.50	each .15	each .20	each .30	each .40	each .50	each .60
" Pails, doz. 1.40 1.50 1.70	each .25	each .30	each .40	each .50	each .60	each .70

GLUE CUPS ONLY

PRICE EACH

Quarts	1	1 1/2	2	3	4	5 1/2	7 1/2
Plain iron.....	\$0.20	\$0.24	\$0.24	\$0.30	\$0.54	\$1.20	\$1.40
Porcelain lined	.30	.36	.36	.44	.74	1.60	2.00
Tin lined.....	.44	.56	.56	.68	1.00	2.00	2.50

GALVANIZED PAILS Extra, Regular and Heavy Weight



Regular



Extra Heavy

REGULAR

Capacity Quarts	Weight per Dozen Pounds	Price Each	Price per Dozen
10	24	\$0.45	\$4.50
12	38	.50	5.00
14	30	.55	5.50

EXTRA HEAVY

Wrought forged ears, extra heavy handle, reinforced bottom.

12	39	\$1.20	\$12.00
14	33	1.40	14.00
16	37	1.60	16.00

These pails are often used for hoisting purposes, and are especially desirable for contractors.

GALVANIZED CEMENT PAILS Double Braced Bottoms. Extra Heavy



14 Quart

Each.....\$2.00 Doz.....\$20.00

GALVANIZED FIRE PAILS

Round bottom. Plain galvanized, stenciled in red, "For fire only."



14 qt.....each, \$0.70 Doz.....\$7.00

WOODEN PAILS



J. I. C. PAILS

J. I. C. Pails are made of heavy oak, with iron bails. Capacity 14 quarts.

Price, each.....\$ 1.00
Doz.....10.00

COMMON PINE PAILS

Two Hoop. Price, each...\$0.30 Doz.....\$3.00
Three Hoop. Price, each. .40 Doz.....4.00

INDURATED FIBRE PAILS

Made from Wood Fibre



"Star"



Fire

Style	Capacity	Wt. per Doz.	Price Each	Price Doz.
Star.....	12	44	\$0.50	\$5.25
Fire-stenciled.....	12	50	.70	7.00
Railroad or Factory	14	54	.75	7.50

DEEP R. R. FIRE PAILS

Made from Wood Fibre



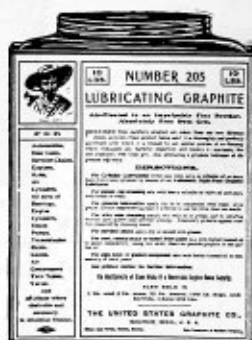
Plain or Stenciled

Capacity quarts	Depth, inches	Diameter, inches	Price	
			Each	Per Doz.
10	13	8	\$0.75	\$7.50

LUBRICATING GRAPHITE



Dixon's Flake Graphite



No. 205 Mexican

DIXON'S FLAKE GRAPHITE

1 lb. paper cans, 30 cans in case	each, \$0.25
5 lb. tin cans, 10 cans in case	" 1.25
10 lb. " 5 " " "	" 2.00
25 lb. cases	per lb., .18
50 lb. " "	" .17
100 lb. kegs	" .16
400 lb. barrels	" .14

No. 205 MEXICAN LUBRICATING GRAPHITE

An air floated Graphite Powder free from grit. A joint compound for pipes, gaskets, flanges, etc.

1 lb. cans, 30 cans in case	per can \$0.22
5 lb. screw-top tin cans, 12 cans in case	" 1.00
10 lb. screw-top tin cans, 6 cans in case	" 1.95
25 lb. strawboard boxes, 2 boxes in case	per box, 3.75
Kegs, about 100 lbs.	" lb., .14
Barrels, about 325 lbs.	" lb., .11

GRAPHITE OR PLUMBAGO

Foundry Facings in Barrels



No. 25. Founders' Wash, an admirable core wash and adaptable for some classes of light castings.	
No. 30. Mexican Lead, suitable for light and medium castings where work is not slicked, also in connection with green sand work.	
No. 40. Mexican Plumbago, for medium and heavy castings, can under many circumstances be successfully slicked, and if used intelligently will not follow the tool.	
No. 50. Mexican Plumbago, suitable for general foundry work, including ornamental iron and return work. Thoroughly reliable, will slick to perfection and is really the most economical facing, all things considered.	
No. 25.	per lb., \$0.04
No. 30.	" .05
No. 40.	" .06
No. 50.	" .07½

Barrels weigh about 500 pounds.

OILS

Lubricating and Illuminating



CYLINDER OIL

Winfield Brand. This is a filtered high-fire test oil of great viscosity. A fine lubricant and equal to any high-grade oil on the market.

Helmer Brand. Where a good low-priced oil is desired for pumps and similar work this grade will be found most satisfactory.

Furnished in Full Barrels, Half Barrels, and 10, 5, 3 or 1 Gallon Cans

Quality	PRICE PER GALLON		
	In Full Barrels	In Half Barrels	In Cans
Winfield	\$0.60	\$0.65	\$0.70
Helmer .....	.50	.55	.60

Extra charge for packages when furnished in cans.

ENGINE OR MACHINE OIL

Boughton Brand. This is a fine oil compounded especially for general work, and will be found very satisfactory for engines, dynamos, etc.

Harrison Brand. This is a heavy oil intended for all kinds of heavy work, shafting, pulleys, etc.

Furnished in Full Barrels, Half Barrels, and 10, 5, 3 or 1 Gallon Cans

Quality	PRICE PER GALLON		
	In Full Barrels	In Half Barrels	In Cans
Boughton	\$0.30	\$0.35	\$0.40
Harrison .....	.25	.30	.35

Extra charge for packages when furnished in cans.

LUBRICATING BLACK OIL

In Full Barrels, Half Barrels, and 10, 5, 3 or 1 Gallon Cans

Quality	PRICE PER GALLON		
	In Full Barrels	In Half Barrels	In Cans
West Virginia	\$0.25	\$0.30	\$0.35
Zero .....	.18	.22	.26
Winter .....	.16	.19	.22
Summer .....	.14	.17	.20

Extra charge for packages when furnished in cans.

LARD OIL

Quality	PRICE PER GALLON		
	In Full Barrels	In Half Barrels	In Cans
Extra Winter Strained	\$0.90	\$0.95	\$1.00
" No. 1 .....	.80	.85	.90
No. 1 .....	.75	.80	.85
No. 2 .....	.70	.75	.80

Extra charge for packages when furnished in cans.

ILLUMINATING OIL

In full barrels, half barrels and 10-gallon cans.

175° Headlight	}	Market
150° Prime White		
Naphtha		
Gasoline		

BOUGHTON BOILER COMPOUND

A vegetable product we can furnish to suit any condition. In full barrels, half barrels and 25-lb. kits.

Price per lb. \$0.20

TALLOW



Refined Cylinder, in cases of about 100 lbs. each, lb. Market

Pure Cake, in lbs. of about 250 lbs. each, lb. Market

GREASES



ALBANY GREASE

All the grades and numbers of Albany Grease are of the same quality, the only difference being in the consistency. The several grades vary to suit the conditions under which they are to be used, depending upon heat, speed, climate, etc.

No. 0 is very soft, being used in extreme cold weather and on exposed journals.

No. 1 is harder than No. 0 and is used on ordinary journals in cold weather, or in very cold or slow-running journals, also elevator slides.

No. 2 is harder than No. 1, and is the grade ordinarily used in moderate and warm weather and general shafting.

No. 3 is adapted to the use of all stationary, marine and tug boat engines; also shafting in warm weather, dynamos, general electrical and high speed machinery.

No. X is a grade of extra hardness, which will lubricate journals with entire satisfaction, when no oil or lubricant of any other kind would work.

No. XX is a grade of extra hardness and made to stand a higher degree of melting point than our X grade.

No. XXX is a grade made for unusual conditions. Very hard and will stand a higher degree of heat without melting than our XX grade. It is the extreme grade we manufacture and never has failed to overcome all difficulties of lubrication.

Put up in:—

400 pound barrels.....	per pound	\$0.15
200 pound half barrels.....	" "	.20
125 pound kegs.....	" "	.25
5, 10, 25 and 50 pound pails.....	" "	.30

BOUGHTON CUP GREASE

Our Boughton Brand Cup Grease contains no acid or resin. It has a very high fire test and will lubricate perfectly any machinery or bearings upon which compression grease cups can be used.

Put up in:—

Barrels and half barrels.....	per pound	\$0.10
100 pound kegs.....	" "	.12
50, 25 and 10 pound tin pails.....	" "	.20

WINFIELD AXLE GREASE

Put up in:—

	Per Doz.	Per Case	Each
25 pound tin pails.....	\$24.00	.....	\$2.40
15 pound tin pails.....	15.00	.....	1.50
10 pound tin pails.....	12.00	.....	1.20
3 pound tin cans (24 cans to the case).....		\$8.00	.40
1 pound tin cans (48 cans to the case).....		6.00	.15

BOILER COMPOUND

Dearborn Boiler Compound. A vegetable product. Put up in bbls., $\frac{1}{2}$ bbls., 150 and 100 lb. kegs.

Price, per pound.....\$0.15

OIL FILTERS

Every user of lubricating oil must appreciate the fact that the larger portion of all the oil he buys is not consumed by the machinery on which it is used, but passes through, and, but for the fact that it becomes filled with dirt and grit, could be used again. Because of the dirt and grit in it, however, it is thrown away as waste oil. This waste frequently amounts to from 50 to 75 per cent of the oil used. The lubricating properties are not affected in the least, and if the impurities can be eliminated the oil can be used over and over again.

THE "CROSS" OIL FILTER

With a Cross Oil Filter at hand, oil may be used over and over again. There is no waste, and every dollar's worth of oil is used up.



They are made of extra heavy galvanized iron, all joints soldered, lapped and riveted, and neatly painted and decorated in gold, with polished brass fittings and bosses and nickel-plated rim. All inside work is rigidly braced and reinforced.

No.	Daily (24 hours) Capacity, gallons	Price Each
1	15 to 20.....	\$ 29.50
2	3 to 5.....	19.50
3	30 to 40.....	60.00
4	50 to 60.....	75.00
5	70 to 90.....	90.00
6	100 to 120.....	110.00
7	120 to 150.....	130.00
8	150 to 200.....	165.00
9	200 to 250.....	200.00
10	250 to 300.....	250.00
11	300 to 400.....	300.00
12	400 to 500.....	350.00

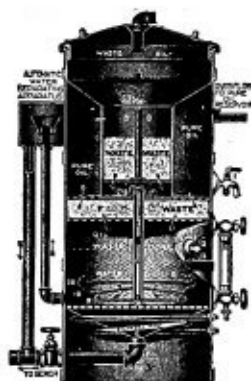
The "Special" filters are fitted with a cover having nickel-plated handles; also with a gauge to show amount of filtered (pure) oil in reservoir. Any size of cocks will be furnished at buyer's option.

CROSS "STYLE B" OIL FILTER

In a great many power plants water becomes mixed with the waste lubricating oil and considerable difficulty has been experienced in filtering this oil.

Style "B" Oil Filter will automatically separate water in any quantity from waste oil, and at the same time clean the oil so that it can be used over again.

This filter will also take the condensed water and oil from oil separators, feed water heaters and exhaust heads and successfully separate the cylinder oil from the water and filter the oil perfectly.



THE CROSS "STYLE B" OIL FILTER
Patent

Sectional View

No.	Daily (24 hours) Capacity, gallons	Price Each
1	3 to 5.....	\$ 25.00
2	15 to 20.....	40.00
3	30 to 40.....	70.00
4	50 to 60.....	90.00
5	70 to 90.....	110.00
6	100 to 120.....	130.00
7	120 to 150.....	150.00
8	150 to 200.....	180.00
9	200 to 250.....	225.00
10	250 to 300.....	275.00
11	300 to 400.....	350.00
12	400 to 500.....	400.00

In ordering the "Style B" Filter it is advisable to state the exact requirements and conditions under which the Filter is to be operated.

SISAL LATHYARN



"Star" Brand Tarred Lath yarn

Yarns are all evenly spun and lightly tarred.

200	ends, Fine.....	Basis of Sisal Rope	
130	" Medium.....	less per lb.,	$\frac{1}{2}c$
110	" Coarse.....	" "	$\frac{1}{2}c$
	Carried in 100 and 200 lb. coils.		
	200 lb. coils sent unless otherwise specified.		

Sisal Ring yarn, or Untarred Lath yarn

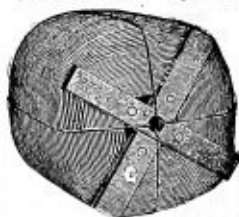
110	ends { Coarse.....	Basis of Sisal Rope	
130	" { Medium.....	" "	"
200	" { Fine.....	add, per lb.,	$\frac{1}{2}c$
	Carried in 100 and 200 lb. coils.		

SISAL HIDE ROPE



2	and 3 ply, medium (60 ends).....	Basis price	
2	" fine (100 ends).....	add, per lb.,	$\frac{1}{2}c$
	Uncoiled, special.....	" "	1c
	Marline laid, special.....	" "	$1\frac{1}{2}c$
	Uncoiled and Marline laid, special..	" "	$2\frac{1}{2}c$
	Our regular stock is in 100 lb. coils.		

SISAL HAY ROPE



2	and 3 ply, medium (regular stock), oiled	Basis price	
2	ply, fine (regular stock), oiled.....	add, per lb.,	$\frac{1}{2}c$
2	and 3 ply, medium, uncoiled,		
	special.....	" "	$\frac{1}{2}c$
2	ply, fine, uncoiled, special.....	" "	1c
	Marline laid, special.....	" "	$1\frac{1}{2}c$
	Regular stock is put up on reels of about 50 lbs. each.		

SISAL BALING ROPE

Any ply, put up on reels of 50 lbs. each and in coils of 100 lbs.

TARRED HEMP CORDAGE



India Tarred Marline

Put up in 1 lb. balls packed in barrels, also in 5 and 25 lb. coils.

		Per Lb.
India 2 ply tarred Marline.....	Market	
This is regular grade and is always sent unless otherwise specified.		
"Yacht" Marline, 1 lb. balls.....	Market	
Houseline, 3 ply.....	"	

Diamond "F" Tarred Cordage

	Made of Pure Long-line American Hemp.	
2 ply Marline.....	Market	
" 2 " Yacht Marline.....	"	
" 3 " Houseline.....	"	
" 6, 9 and 12 thread Ratline.....	"	
" 2 and 3 ply Spun Yarn.....	"	
" 6, 9, 12 and 15 thread Seizing.....	"	

MANILA SPUN YARN

Not Tarred

Put up with 2 or 3 yarns, loosely spun in 5 and 10 lb. balls..... Market

A J A X

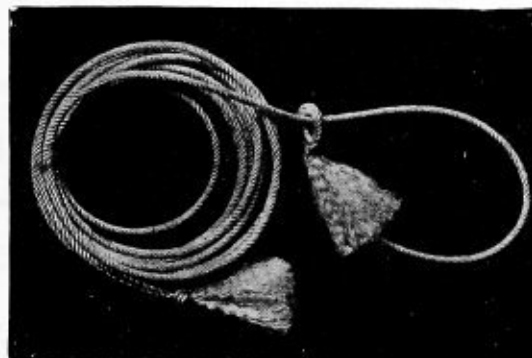
Long Fibre
Manila Rope

INSURES

Greatest
Strength, Safety
AND
Economy

AJAX TRANSMISSION ROPE
AJAX HOISTING ROPE
AJAX WRECKING ROPE
AJAX CAR PULLING ROPE
AJAX PILE DRIVING ROPE

"BLACK JACK" LARIAT ROPES



Well known throughout the cattle-country, we have been making them for the last 20 years.

Only the very finest selected Manila fibre is used in the manufacture of the rope, which is $\frac{7}{8}$ in. diameter and laid up very hard and smoothly. The rope will not kink but runs freely through the egg-shaped brass "honda" or thimble which is spliced into one end of the lariat and finished with an 8-inch tassel; the other end has a "Matthew Walker" knot, also finished with a tassel.

We furnish ropes 3 or 4 stranded and either plain or prepared as desired.

The prepared ropes are specially treated, making them waterproof and very slippery.

Length, feet..... 35 40 45 50
Plain ropes, per doz.... \$20.00 22.00 24.00 26.00
Prepared ropes, per doz. 24.00 26.00 28.00 30.00

SASH CORD



In 100 ft. hanks (two connected), 1 doz. in a package.

Our "Imperial" Solid Braided Cotton Sash Cord is made of selected cotton. It is finely finished and runs even in size.

No.	Diam. Inch.	Weight, per Dozen Hanks, Lbs.	No. Feet in One Lb.	Price per Lb.
6	$\frac{3}{16}$	18	66	Add $1\frac{1}{2}c$
7	$\frac{7}{16}$	23	52	" $\frac{1}{2}c$
8	$\frac{1}{4}$	27	44	Base
9	$\frac{9}{16}$	33	36	"
10	$\frac{5}{8}$	44	27	"
12	$\frac{3}{4}$	60	20	"
16	$\frac{7}{8}$	*	7	Add $1\frac{1}{2}c$

*No. 16 is wound on reels of 100 feet each. Weight per 100 feet, 14 $\frac{3}{4}$ pounds. All sizes also furnished in 1200 foot coils.

HEMP SASH CORD

Twisted and Cable Laid

India hemp sash cord..... per lb., Market
Italian " " " " " "

Put up in 50 and 100 pound Coils.

RAILROAD BELL CORD

Put up in 1200 foot Coils or Reels. Also 50 and 100 pound Coils.

Imperial braided cotton, white..... per lb., Market
" " " drab..... " "
" " " mahogany..... " "
India hemp, twisted and cable laid.... " "
Italian " " " " " "

IMPERIAL SOLID BRAIDED COTTON ROPE

For Dumb Waiter Cord, Drum Banding, Lifts, Lariats, Etc.

Put Up in Coils of 1200 Feet.

No..... 14 16 18 20 24 28 32
Diam..... $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ 1
Weight per 100 ft. 7 8 $\frac{1}{2}$ 11 13 17 23 28
Price per lb. \$

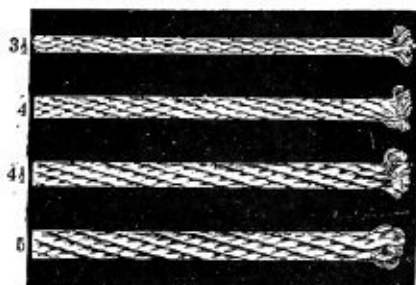
ROUND STEEL COUPLINGS

For Round Belt or Braided Rope or Cord



Made in sizes $\frac{1}{4}$ to 1 inch. For price list see page 608. $\frac{1}{16}$

BRAIDED COTTON MASONS' LINES



Put up in hanks of 48 feet each, several connected, 1 dozen (192 yards) in a box, except No. 5, which is put up in 100 foot hanks.

Price per Dozen

Nos..... 3 $\frac{1}{2}$ 4 4 $\frac{1}{2}$ 5
White or drab..... \$1.50 \$2.00 \$2.50 \$ 7.50
Other colors..... 1.75 2.25 2.75
Linen..... 2.50 3.50 4.50 12.00

SOLID BRAIDED CHALK LINES



Bleached cotton, put up in hanks of 20 feet each, 1 dozen in a bunch, packed in gross and $\frac{1}{2}$ gross boxes.

Nos..... 0 1 2 3
Per gross..... \$6.00 6.50 7.00 7.50

ITALIAN HEMP GARDEN LINES

Solid braided, in hanks of 100 feet each (two lines connected), 1 dozen in a package.

Italian hemp, size of No. 4 $\frac{1}{2}$ per doz., \$5.00

TWINES

FINELY FINISHED WRAPPING TWINES



Quality	No. 12 Advance	No. 18 Base	No. 24 Less	No. 36 Less	No. 48 Less
"Amber" India Hemp.....	2c	Base 1/2c	1c	1 1/2c	1 1/2c
"B. C." American Hemp.....	2c	" 1/2c	1c	1 1/2c	1 1/2c
Italian Hemp.....	2c	" 1/2c	1c	1 1/2c	1 1/2c

Put up in 1/2 lb. balls, in 3 lb. packages, in 168 lb. bales; also furnished loose in barrels and on reels, or cut to lengths.

HEAVY HEMP TWINES



India Hemp					
Nos.	4 1/2	6	7	8	
			Less	Less	
Per lb., Base.	Base	Base	1/2c	1c	
American Hemp					
Nos.	4 1/2	6	7	8	
			Less	Less	
Per lb., Base.	Base	Base	1/2c	1c	

Put up in balls, in bales and on reels and also furnished "bull rope" shape (50 ends).

MATTRESS TWINES

Made of Pure Flax

No. 252.....per lb., Market

In 1/2 lb. balls, 3 lb. packages, in 168 lb. bales and also furnished loose in barrels.



JUTE WRAPPING TWINE

1/2 lb. balls, in patent barrels.
2 to 10 ply.....per lb., Market
Hide Rope form, 50 and 100
lb. coils, 100 ends, 3 and
4 ply.....per lb., "

JUTE "TUBE ROPE"
OR CORD

4 to 8 ply....per lb., Market

Also furnished in 10 and 25 lb. balls, in bales of 300 lbs. each, on 50 lb. reels, and in hide rope or bull rope shape.



JUTE "PAPERMAKERS" TWINE

For heavy bundles of paper. Cheapest heavy twine made. On 100 lb. reels,

2 ply. Size No. 4 1/2.....per lb., Market
3 ply. Size 6-8....."

"SUPERIOR" HAND LAID, COTTON
SEINE TWINE

Put up in 5 lb. packages, in 100 lb. bales, also in balls and on tubes.

"Superior" Twines are made in the most careful manner of the finest cotton.



Soft Laid		Medium Laid	
	Per Lb.		Per Lb.
6 thread.....	Advance 3c	6 thread.....	Advance 4 1/2c
9 ".....	" 1/2c	9 ".....	" 1 1/2c
12 ".....	Base 1/2c	12 ".....	" 1 1/2c
16 and larger.....	Less 1/2c	16 to 42 thread.....	Base 1 1/2c
		Larger.....	Less 1/2c

Hard Laid, or Patent

	Per Lb.		Per Lb.
6 thread.....	Advance 1 1/2c	15 to 42 thread.....	Advance 1 1/2c
9 ".....	" 5c	Larger.....	" 1c
12 ".....	" 2 1/2c		

TROT LINE

Put up in 1 lb. balls, packed in barrels.

Sizes.....Nos. 000, 00, 0 1, 2, 3, 4, 5, 6
Price per lb.....Market Market Market

"TOPSAIL" SUPERIOR COTTON SAIL
TWINE

Put up in 1 lb. balls, packed in barrels.

4 to 16 ply.....per lb., Market
Normans on 2 lb. cones, 3 and 4 ply.. "

"GENEVA" COTTON WRAPPING TWINE



Ball



Cone

3 and 4 ply.....per lb., Market

Put up in 5 lb. packages, in 100 lb. bales and on cones.

COTTON ROPE



Tube



Coil

1/4 to 1/2 on tubes, larger in coils.
Strictly "A" grade—full thread.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 1/2	2	3	4	5	6	8	10	12	16	20	24	30	36	42	48	60	72	84	96	108	120	144	168	180	200	216	240	270	300	360	420	480	540	600	720	840	960	1080	1200	1440	1680	1800	2000	2160	2400	2700	3000	3600	4200	4800	5400	6000	7200	8400	9600	10800	12000	14400	16800	18000	20000	21600	24000	27000	30000	36000	42000	48000	54000	60000	72000	84000	96000	108000	120000	144000	168000	180000	200000	216000	240000	270000	300000	360000	420000	480000	540000	600000	720000	840000	960000	1080000	1200000	1440000	1680000	1800000	2000000	2160000	2400000	2700000	3000000	3600000	4200000	4800000	5400000	6000000	7200000	8400000	9600000	10800000	12000000	14400000	16800000	18000000	20000000	21600000	24000000	27000000	30000000	36000000	42000000	48000000	54000000	60000000	72000000	84000000	96000000	108000000	120000000	144000000	168000000	180000000	200000000	216000000	240000000	270000000	300000000	360000000	420000000	480000000	540000000	600000000	720000000	840000000	960000000	1080000000	1200000000	1440000000	1680000000	1800000000	2000000000	2160000000	2400000000	2700000000	3000000000	3600000000	4200000000	4800000000	5400000000	6000000000	7200000000	8400000000	9600000000	10800000000	12000000000	14400000000	16800000000	18000000000	20000000000	21600000000	24000000000	27000000000	30000000000	36000000000	42000000000	48000000000	54000000000	60000000000	72000000000	84000000000	96000000000	108000000000	120000000000	144000000000	168000000000	180000000000	200000000000	216000000000	240000000000	270000000000	300000000000	360000000000	420000000000	480000000000	540000000000	600000000000	720000000000	840000000000	960000000000	1080000000000	1200000000000	1440000000000	1680000000000	1800000000000	2000000000000	2160000000000	2400000000000	2700000000000	3000000000000	3600000000000	4200000000000	4800000000000	5400000000000	6000000000000	7200000000000	8400000000000	9600000000000	10800000000000	12000000000000	14400000000000	16800000000000	18000000000000	20000000000000	21600000000000	24000000000000	27000000000000	30000000000000	36000000000000	42000000000000	48000000000000	54000000000000	60000000000000	72000000000000	84000000000000	96000000000000	108000000000000	120000000000000	144000000000000	168000000000000	180000000000000	200000000000000	216000000000000	240000000000000	270000000000000	300000000000000	360000000000000	420000000000000	480000000000000	540000000000000	600000000000000	720000000000000	840000000000000	960000000000000	1080000000000000	1200000000000000	1440000000000000	1680000000000000	1800000000000000	2000000000000000	2160000000000000	2400000000000000	2700000000000000	3000000000000000	3600000000000000	4200000000000000	4800000000000000	5400000000000000	6000000000000000	7200000000000000	8400000000000000	9600000000000000	10800000000000000	12000000000000000	14400000000000000	16800000000000000	18000000000000000	20000000000000000	21600000000000000	24000000000000000	27000000000000000	30000000000000000	36000000000000000	42000000000000000	48000000000000000	54000000000000000	60000000000000000	72000000000000000	84000000000000000	96000000000000000	108000000000000000	120000000000000000	144000000000000000	168000000000000000	180000000000000000	200000000000000000	216000000000000000	240000000000000000	270000000000000000	300000000000000000	360000000000000000	420000000000000000	480000000000000000	540000000000000000	600000000000000000	720000000000000000	840000000000000000	960000000000000000	1080000000000000000	1200000000000000000	1440000000000000000	1680000000000000000	1800000000000000000	2000000000000000000	2160000000000000000	2400000000000000000	2700000000000000000	3000000000000000000	3600000000000000000	4200000000000000000	4800000000000000000	5400000000000000000	6000000000000000000	7200000000000000000	8400000000000000000	9600000000000000000	10800000000000000000	12000000000000000000	14400000000000000000	16800000000000000000	18000000000000000000	20000000000000000000	21600000000000000000	24000000000000000000	27000000000000000000	30000000000000000000	36000000000000000000	42000000000000000000	48000000000000000000	54000000000000000000	60000000000000000000	72000000000000000000	84000000000000000000	96000000000000000000	108000000000000000000	120000000000000000000	144000000000000000000	168000000000000000000	180000000000000000000	200000000000000000000	216000000000000000000	240000000000000000000	270000000000000000000	300000000000000000000	360000000000000000000	420000000000000000000	480000000000000000000	540000000000000000000	600000000000000000000	720000000000000000000	840000000000000000000	960000000000000000000	1080000000000000000000	1200000000000000000000	1440000000000000000000	1680000000000000000000	1800000000000000000000	2000000000000000000000	2160000000000000000000	2400000000000000000000	2700000000000000000000	3000000000000000000000	3600000000000000000000	4200000000000000000000	4800000000000000000000	5400000000000000000000	6000000000000000000000	7200000000000000000000	8400000000000000000000	9600000000000000000000	10800000000000000000000	12000000000000000000000	14400000000000000000000	1680000000000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SEWING AND BALING TWINE

MILLERS' DELIGHT



Our Millers' Delight is a low priced sewing twine put up in 50 and 100 pound coils with 100 ends, so that the user can with a single cut get 100 pieces of any length desired. It is spun from absolutely clean, stainless fibre, uniformly sized for sewing, and is used very largely for both tying and sewing bags.

3, 4 and 6 ply.....per lb., Market

ANCHOR SEWING TWINE

Made of American Hemp



Our Anchor sewing twine is made of American hemp, and is stronger than our Millers' Delight. We carry it put up in skeins in 12 lb. packages, in 144 lb. bales.

3, 4, 5 and 6 ply.....per lb., Market

JUPITER SEWING TWINE

Made of Strictly Pure American Hemp

Our Jupiter is made of a very fine quality of American hemp and evenly spun. It is stronger and smoother than our Anchor and will run further to the pound. We carry it put up in skeins in 12 lb. packages, in 144 lb. bales; in 1 lb. balls. Also in 50 lb. Hide Rope Coils 50 Ends.

3, 4, 5 and 6 ply.....per lb., Market

RELiance SEWING TWINE

Made of Pure Flax



Our Reliance is put up in skeins in 12 pound packages and in balls. It is smoother, will run further to the pound, and is much stronger than American hemp twine.

3, 4, 5 and 6 ply.....per lb., Market

SUPERIOR SEWING TWINE

Made of Pure Long Line Flax



Our Superior sewing twine is put up on reels in 50 ends, and in skeins in 12 lb. packages, in 144 lb. bales. It is stronger than our Reliance and will run further to the pound.

3, 4 and 6 ply.....per lb., Market

ANDOVER SEWING TWINE

Andover sewing twine is put up in skeins in 12 lb. packages, in 144 lb. bales. Is smooth and strong and will run far to the pound.

3 and 4 ply.....per lb., Market

SILVER FINISH SEWING TWINE

Silver finish twine is put up in skeins in 12 lb. packages, in 144 pound bales. It will run far to the pound. On account of its finish is exceptionally smooth.

3 and 4 ply.....per lb., Market

LILY WHITE COTTON TWINE

For Flour Sacks

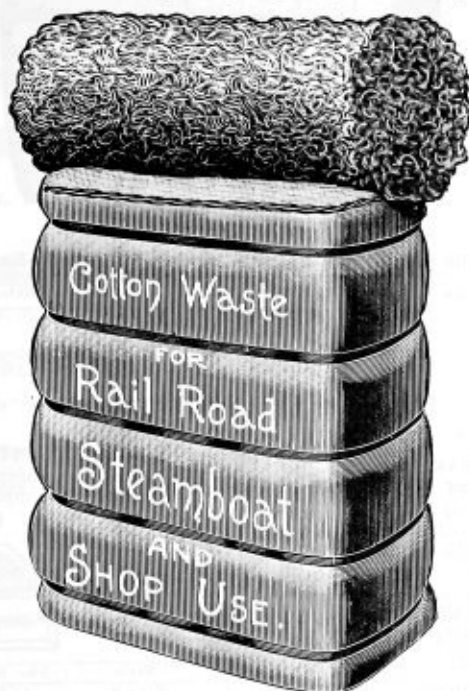


Our Lily White is put up on 50 lb. reels with 50 ends. Is made of fine white cotton and will run very far to the pound. Where the strength of a flax twine is not required Lily White is very economical.

10 ply.....per lb., Market

WASTE

We carry a very large and complete stock of White and Colored Cotton and Wool Waste. Our grades do not change. Our customers can depend upon getting the same quality at all times.



Put up in Small Bales of about 125 Pounds Each and Large Bales about 500 Pounds Each

WHITE COTTON WASTE

Extra. Machine Copped.....	Price per pound, \$.....
No. 1. " "	" " "
No. 2. " "	" " "

COLORED COTTON WASTE

Fancy.....	Price per pound, \$.....
No. 1.....	" " "
No. 2.....	" " "

SPECIAL SELECTED FINE QUALITY WASTE

For Rubbing Fine Furniture, Etc.

Put up in 125 pound bales only.....	Price per pound, \$.....
-------------------------------------	--------------------------

WOOL WASTE (COLORED)

"A" Grade—95° Pure Wool.....	Price per pound, \$.....
Standard Grade.....	" " "

RAGS OR WIPERS

White, washed.....	Price per pound, \$.....
Colored, "	" " "

H.Channon Company. Chicago.

OAKUM—TARRED



For Calking—In Bales Weighing 50 Pounds Each

Quality	Price per Bale	Price per Pound in Less Than Bale Lots
Best Spun	\$6.00	\$0.15
Best Unspun.....	5.50	.14
U. S. Navy Unspun.....	5.00	.13
Navy Unspun.....	4.50	.....

Spun Oakum carried in stock in the best quality only.

Navy Unspun Oakum is not recommended for calking purposes.

PLUMBERS' OAKUM For Packing Water Mains

Plumbers' Oakum is made of jute and is consequently lower in price than the oakum made of hemp listed above, but is a very short fiber and not suitable for calking purposes.

Per bale.....\$2.50

SPUN CALKING COTTON

In one pound packages or 100 pound bales.

NavyPer lb. \$0.15

Yacht, extra quality....." " .20

PITCH MOPS

Wool, with handle.....Each \$0.60

PITCH LADLES

Tin, improved pattern.....Each \$0.65

Galvanized Iron, improved pattern....." .75

CANDLES



Style	Size Boxes	No. in Pound	Price per Lb.
Star 8s	40 lbs.	8	\$0.18
Coach 3s	40 lbs.	3	.16

TAR, PITCH AND RESIN



PINE TAR

1 Quart Cans	}Market
2 " "		
1 Gallon "		
2 " "		
3 " "		
5 " "	}Market
50 " Barrels		

COAL TAR

1 Gallon Cans	}Market
2 " "		
3 " "		
5 " "		
50 " Barrels		



PINE PITCH

5 lb. Boxes.	}Market
25 " "		
50 " "		
200 " Barrels.		

COMPOSITION OR COAL TAR PITCH For Covering Seams and for Roofing

In 500 lb. Barrels.....Market

RESIN

5 lb. Boxes.	}Market
25 " "		
50 " "		
500 " Barrels.		

CALKING IRONS

Calking or Making Irons



Calking or Making. Fig. 1



Deck or Dumb. Fig. 2



Bent. Fig. 3



Spike. Fig. 4



Sharp or Butt. Fig. 5

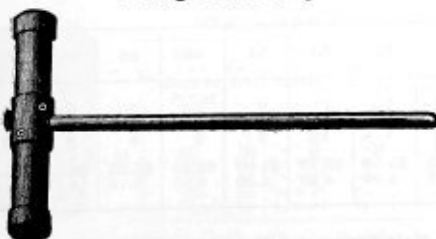


Clearing or Reefing. Fig. 6

Style	Common, per Doz.	Drew's, per Doz.
Calking irons, No. 0 crease, $\frac{1}{8}$ inch thick.....	\$4.50	\$ 8.00
Calking irons, No. 1 crease (or making), $\frac{1}{8}$ inch thick.....	4.65	8.00
Calking irons, No. 2 crease (or making), $\frac{1}{8}$ inch thick.....	4.75	8.00
Calking irons, No. 3 crease (or making), $\frac{1}{4}$ inch thick.....	4.85	8.00
Deck or dumb irons.....	5.25	9.00
Crooked or bent irons.....	5.25	9.50
Double bent irons.....	5.75	10.00
Spike irons.....	5.00	8.00
Sharp or butt irons.....	6.00	10.00
Clearing or reefing irons.....	5.25	9.00

HAWSING BEETLES

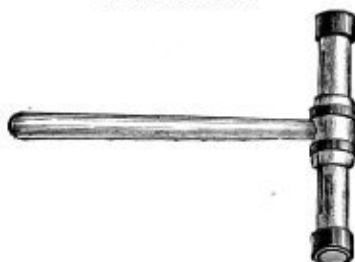
Wrought Iron Rings



Extra live oak. Each.....\$2.00

CALKING MALLETS

Locust Handles



Best Live Oak

No. 000.	Price each	\$3.00
No. 00.	" "	2.80
No. 0.	" "	2.50
No. 1.	" "	2.20

Polished tempered steel rings.

HAWSING IRONS

Solid Steel



Blades polished, $\frac{1}{4}$ inch thick.	Per dozen	\$20.00
" blacked, $\frac{1}{4}$ " " " "	" "	15.00
" polished, bent.....	" "	25.00
" blacked, " " " "	" "	20.00

Blades $\frac{3}{8}$ and $\frac{1}{2}$ inch thick furnished at same price.

REAMING IRONS

Solid Steel



Per dozen.....\$7.50

OIL CUPS

PLAIN BRASS OIL CUPS



Number.....	00	0	1	2	3	4	5	6	7	8	9
Outside Diameter, inches.....	$\frac{5}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$
Shank Pipe Thread, ".....	$\frac{5}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$
Plain Finished Brass, each.....	\$0.25	\$0.30	\$0.35	\$0.40	\$0.60	\$0.90	\$1.25	\$1.60	\$1.75	\$2.25	\$2.75
Locomotive Pattern, Finished Brass, each.....	.30	.35	.40	.50	.75	1.00	1.50	1.80	2.00	2.50	3.00



"PLAIN GLASS" OIL CUPS

Number.....	000	00	0	1	1 $\frac{1}{2}$	2	3	4	5	6
Extreme Outside Diameter of Cup, inches.....	1 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	3 $\frac{1}{8}$	3 $\frac{1}{16}$
Extreme Height of Cup (over all), inches.....	2 $\frac{1}{4}$	2 $\frac{1}{16}$	3 $\frac{1}{16}$	3 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{16}$	4 $\frac{1}{8}$	5	6	7 $\frac{1}{4}$
Outside Diameter of Glass, inches.....	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{8}$	2 $\frac{1}{4}$	3	3 $\frac{1}{2}$
Height of Glass, inches.....	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{8}$	2 $\frac{1}{4}$	3	4
Capacity, ounces.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{4}$	3	4	5
Shank Pipe Thread, inch.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{4}$	3	4	5
Finished Brass, each.....	\$0.70	\$0.75	\$0.80	\$1.00	\$1.25	\$1.50	\$1.90	\$2.40	\$3.10	\$4.00
Nickel Plated, each.....	.80	.85	.95	1.20	1.50	1.75	2.20	2.75	3.50	4.50

"SIGNAL" SNAP LEVER AND SIGHT FEED

Number.....	0	1	1 $\frac{1}{2}$	2	3	4	5	6
Extreme Outside Diameter of Cup, inches.....	1 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{16}$	2 $\frac{1}{4}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	3 $\frac{1}{8}$	3 $\frac{1}{16}$
Extreme Height of Cup over all (Lever Up), inches.....	5 $\frac{1}{4}$	5 $\frac{1}{16}$	5 $\frac{1}{16}$	6 $\frac{1}{4}$	6 $\frac{1}{16}$	7 $\frac{1}{16}$	8 $\frac{1}{16}$	9 $\frac{1}{16}$
Outside Diameter of Glass, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$
Height of Glass, inches.....	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	3
Capacity, ounces.....	$\frac{3}{8}$	1	1 $\frac{1}{2}$	2	3	4	5	6
Shank Pipe Thread, inch.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{4}$	3
Finished Brass, each.....	\$3.00	\$3.25	\$3.50	\$3.75	\$4.25	\$5.25	\$7.25	\$9.25
Nickel Plated, each.....	3.50	3.75	4.00	4.25	4.75	5.75	8.00	10.25

"DETROIT" GLASS BODY OIL CUPS

With Sight-Feed, Set-Feed and Step-Feed Features

Number.....	50	51	52	53	54	55	56	56 $\frac{1}{2}$	57
Diameter, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3
Height, inches.....	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3
Capacity, ounces.....	$\frac{3}{4}$	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	3	4	6	8
Pipe Thread, inch.....	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Brass, each.....	\$3.00	\$3.25	\$3.50	\$3.75	\$4.00	\$4.45	\$5.25	\$6.25	\$7.30
Nickel.....	3.50	3.75	4.00	4.25	4.50	4.90	5.75	6.75	8.05

CRANK PIN PLUNGER OILERS

With Double Feed and Automatic Shut-off

The hollow plunger provides two feeds, a positive force feed from the bottom of cup and a flash feed from the top.

Cup does not require to be shut off when engine is stopped, as the plunger "H" seats at the bottom of cup, and oil will not feed except when engine is running.

PRICE LIST

Size Number	400	401	402	403	404	405
Outside Diameter of Glass.....inches	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
Height of Glass.....inches	1 1/4	1 1/2	1 3/4	1 7/8	2 1/8	2 3/8
Capacity.....ounces	3/8	1	1 1/4	2 1/4	4	5
Pipe Thread of Shank.....	3/4	3/4	3/8	3/8	1/2	1/2
Price, Brass Finish.....each	\$1.50	\$1.75	\$2.00	\$2.50	\$3.00	\$4.00
Price, Nickel Plated.....each	1.90	2.20	2.50	3.00	3.60	4.70



GLASS CYLINDER OIL PUMPS

The shank has a union coupling for convenience in attaching—simply screw the coupling tail into the steam chest, then connect the pump by means of the coupling nut. Far more convenient than the old method of swinging around the entire pump, frequently having to dismantle it owing to lack of space in which to turn it.

PRICE LIST

Size Number	1	1 1/2	2	3
Outside Diameter of Glass.....inches	2 1/4	3	3 1/2	4 1/2
Height of Glass.....inches	2 1/8	3	4	5
Capacity.....pints	1 1/2	2 1/2	1	2
Pipe Thread of Shank.....	3/8	3/8	1/2	1/2
Price, Brass.....each	\$7.50	\$8.50	\$10.00	\$15.00
Price, Nickel Plated.....each	8.00	9.50	11.00	16.50



HAND CYLINDER OIL PUMPS

PRICE LIST

Size Number	Capacity	Connections	Size of Bowl	PRICE—BRASS FINISH	
				With Screw Top	With Strainer Top
500	1/4 pint	3/8 inch	2 1/4 x 2 1/4	\$3.50	\$3.65
501	1/2 "	3/8 "	2 3/4 x 2 3/4	5.00	5.25
502	1 "	3/8 "	3 1/2 x 3 1/2	7.50	7.80



OIL HOLE COVERS

Dust Proof

SIZES AND PRICES

No.	Size of Plain Shank for Driving	Size of Body	Size of Threads	Diameter of Cap	Price, Nickel Plated, per 100
0	...	1/4	10 x 32	5/16	\$ 7.00
1	...	1/4	1/4 x 32	3/8	7.00
2	...	5/16	5/16 x 32	1/2	9.50
3	...	3/8	3/8 x 24	1/2	10.70
4	...	1/2	1/2 x 24	5/8	12.50
5	...	3/4	3/4 x 24	3/4	16.00



Covers are carried in stock with pipe threads, viz:
No. 4, 1/4 pipe thread.
" 5, 3/4 "

BRASS LOOSE PULLEY OILERS



No.	0	1	2	3	4
Outside diameter, inches,	1	1 1/4	1 1/2	1 3/4	2
Capacity, oz.	1/4	3/4	1 1/4	1 3/4	2 1/4
Price each.....	\$0.25	\$0.30	\$0.40	\$0.50	\$0.65

GREASE CUPS

PLAIN GREASE CUPS. STEEL OR BRASS



Number	00	0	1	2	3	4
Inside Diameter, inches.....	1	1 1/4	1 1/2	2	2 1/2	3
Shank Pipe Thread, inches.....	1/4	1/4 or 3/8	1/4	1/4 or 3/8	3/8 or 1/2	1/2
Capacity, ounces.....	1/2	3/4	1	2	3 1/2	5 1/2
Plain Steel, each.....	\$0.70	\$0.90	\$1.15	\$1.50	\$2.15	\$2.90
Blue Steel, each.....	.90	1.15	1.40	1.80	2.60	3.50
Plain Brass, each.....	.70	.90	1.15	1.60	2.15	2.90
Polished Brass with Leather Disc.....	.80	1.05	1.30	1.70	2.45	3.25



POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS

"RENOWN" GREASE CUPS

Number.....	00	0	1	2	3	4
Inside Diameter, inches.....	1	1 1/4	1 1/2	2	2 1/2	3
Extreme Outside Diameter, inches.....	1 1/4	1 3/4	2	2 3/4	3 1/4	3 3/4
Extreme Height over all (Plunger Raised). Cup Open, inches.....	3 1/2	4 1/2	5 1/2	6 3/8	7 1/2	8 1/2
Shank Pipe Thread, inch.....	3/4	1	1 1/4	1 1/2	1 3/4	2
Capacity Grease, ounces.....	1 1/2	2 1/4	3 1/2	5 1/2	8 1/2	12 1/2
Finished Brass, each.....	\$1.50	\$2.00	\$2.50	\$3.20	\$4.30	\$6.00
Nickel Plated, each.....	1.75	2.25	2.80	3.60	5.00	6.75

ALL BRASS AND ALL IRON COMPRESSION GREASE CUPS

"COIN," ALL BRASS

Number	00	0	1	2	3
Diameter Body, inches.....	1	1 1/4	1 1/2	2	2 1/2
Capacity, ounces.....	1 1/2	2 1/4	3 1/2	5 1/2	8 1/2
Shank Pipe Thread, inches.....	1/2	3/4	1	1 1/4	1 1/2
Price per dozen.....	\$21.00	\$25.00	\$29.00	\$33.50	\$50.00

"BRUNO," ALL IRON

Number.....	00	0	1	2	3
Diameter Body, inches.....	1	1 1/4	1 1/2	2	2 1/2
Capacity, ounces.....	1 1/2	2 1/4	3 1/2	5 1/2	8 1/2
Shank pipe Thread, inches.....	1/2	3/4	1	1 1/4	1 1/2
Painted, price per dozen.....	\$10.00	\$11.25	\$12.00	\$12.50	\$25.00

No. 2 can be furnished with 1/2-inch male shank if desired.



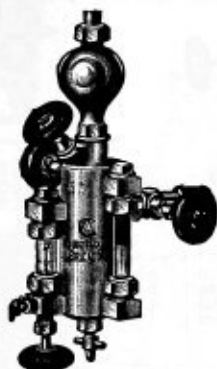
"COLONIAL" SCREW PLUNGER GREASE CUPS

ALL BRASS. PRICE EACH

Number.....	00	0	1	2	3	4
Inside Diameter of Body, inches.....	1	1 1/4	1 1/2	2	2 1/2	3
Capacity, ounces.....	1 1/2	2 1/4	3 1/2	5 1/2	8 1/2	10 1/2
Shank Pipe Thread, inches.....	1/2	3/4	1	1 1/4	1 1/2	1 3/4
Brass Finished.....	\$1.20	\$1.20	\$1.60	\$2.00	\$2.80	\$4.00
Nickel Plated.....	1.20	1.45	1.90	2.40	3.40	4.75

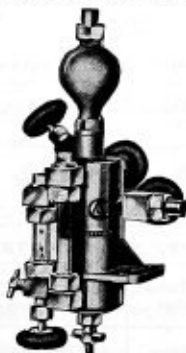
THE "DETROIT" IMPROVED STANDARD LUBRICATOR

Double Connection
For Stationary Engines



Capacity, Pints	For Cylinder, inches	PRICE EACH	
		Finished Brass	Nickel Plated
$\frac{1}{2}$	Under 10	\$17.00	\$20.00
$\frac{1}{2}$	10 to 12	22.00	25.00
1	12 to 18	30.00	35.00
2	18 to 30	45.00	50.00
4	30 and over	60.00	65.00
8	30	75.00	80.00

THE "DETROIT" IMPROVED STANDARD LUBRICATOR WITH BRACKET



Intended particularly for use on steam shovels, logging engines, hoisting engines and similar outfits where considerable vibration and jarring is experienced in connection with the working of the engine. A bracket is cast on the body of the lubricator, and by means of this bracket the lubricator is attached to some substantial portion of the boiler or engine.

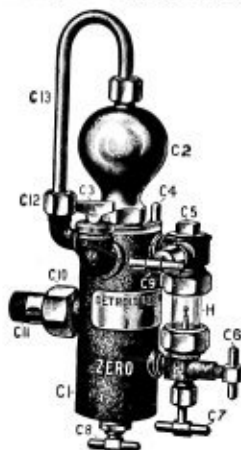
Size	$\frac{1}{2}$ Pint	$\frac{1}{2}$ Pint	1 Pint	1 Quart
For Cylinder	Under 10 inches	10 to 12 inches	12 to 18 inches	18 to 30 inches
Brass Finish ..	\$17.00	\$22.00	\$30.00	\$45.00
Nickel Finish..	20.00	25.00	35.00	50.00

Pipe thread on tail piece oil delivery pipe $\frac{1}{8}$ -inch for all sizes.

Sizes of Glasses Used

Sight Feed....	$\frac{5}{8} \times 2\frac{1}{2}$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3\frac{1}{2}$
Gauge	$\frac{5}{8} \times 2\frac{1}{2}$	$\frac{5}{8} \times 3\frac{1}{4}$	$\frac{5}{8} \times 4\frac{1}{2}$	$\frac{5}{8} \times 4\frac{3}{4}$

THE "DETROIT" ZERO LUBRICATOR



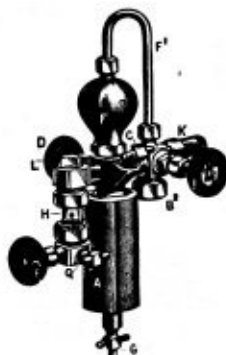
Single Connection

Capacity, pints	PIPE THREAD, INCHES		PRICE EACH	
	Single	Double	Bronzed Body	Nickel Plated
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	\$15.00	\$18.00
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	17.00	20.00
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	20.00	23.00
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	28.00	32.00
1	$\frac{1}{2}$	$\frac{3}{8}$	42.00	47.00

Bronze body lubricators have finished trimmings.

THE "DETROIT" LUBRICATOR

Single Connection. Style "C." For Traction Engines, Portable Engines, Steam Pumps, Etc.



Capacity, pints	Pipe Thread, inches	PRICE EACH	
		Finished Brass	Nickel Plated
$\frac{1}{2}$	$\frac{1}{2}$	\$15.00	\$18.00
$\frac{1}{2}$	$\frac{1}{2}$	17.00	20.00
$\frac{1}{2}$	$\frac{1}{2}$	20.00	23.00
$\frac{1}{2}$	$\frac{1}{2}$	28.00	32.00
1	$\frac{1}{2}$	42.00	47.00

Can be connected to either horizontal or vertical steam pipe, or perpendicularly into the steam chest.

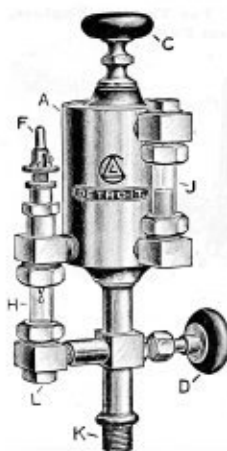


THE "DETROIT" GLASS BODY GAS ENGINE LUBRICATORS

For Use on Gas and Gasoline Engines and Air Compressors

It is equipped with the set feed and stop feed features, so that in case the engine should be stopped at any time the feed of the oil can be instantly shut off, and as instantly started again, when the engine is started, without disturbing the feed regulation.

No.	Outside Diameter, inches	Height, inches	Capacity, ounces	Pipe Thread	Brass, Each	Nickel, Each
24	2	1 7/8	2 1/2	3/8	\$ 5.00	\$ 5.50
25	2 1/4	2 1/8	4	3/8	5.50	6.00
26	2 1/2	2 3/8	5	3/8	6.50	7.00
27	3	3	10	1/2	9.00	9.75
28	3 1/2	4	18	1/2	11.50	12.25



THE "DETROIT" SIGHT-FEED LUBRICATOR

For Gas and Gasoline Engines and Air Compressors

This Lubricator is made of the best brass and is connected to the cylinder direct.

The 1/2 pint and larger sizes can be furnished with gauge glass, if so desired, at a slight additional cost.

Capacity, pints	Pipe Thread, inches	PRICE EACH	
		Brass Body	Nickel Plated
1/4	3/8	\$15.00	\$18.00
1/2	3/8	17.00	20.00
3/4	3/8	20.00	23.00
1	3/8	28.00	32.00
2	3/8	42.00	47.00

PLAIN ENGINE LUBRICATORS



With Drain Cock

Diameter, inches	Shank, inches	Price Each	With Drain Cock, Price Each	Diameter, inches	Shank, inches	Price Each	With Drain Cock, Price Each
1	3/8	\$2.00	\$3.00	2 1/4	3/8	\$3.25	\$4.25
1 1/4	3/8	2.20	3.20	2 1/2	3/8	3.75	4.75
1 1/2	3/8	2.40	3.40	3	3/8	4.75	5.75
1 3/4	3/8	2.60	3.60	3 1/2	3/8	7.00	8.00
2	3/8	2.90	3.90				

"SWIFT" LUBRICATORS Sight Feed



Class F
S. C.



Class G
S. C.



Class F
D. C.

CLASS "G," SINGLE CONNECTION

Capacity, Pints	Pipe Thread, inches	Brass Finish, Price Each	Nickel Plated, Price Each
1/4	3/8	\$2.15	\$2.50
1/2	3/8	2.50	2.85
3/4	3/8	2.90	3.25

CLASS "F," SINGLE CONNECTION

Capacity, Pints	Pipe Thread, inches	Brass Finish, Price Each	Nickel Plated, Price Each
1/4	3/8	\$3.50	\$3.90
1/2	3/8	3.75	4.15
3/4	3/8	4.00	4.40
1	3/8	6.00	6.65
2	3/8	7.50	8.15

CLASS "F," DOUBLE CONNECTION

Capacity, Pints	Pipe Thread, inches	Brass Finish, Price Each	Nickel Plated, Price Each
1/4	3/8	\$2.75	\$3.15
1/2	3/8	3.00	3.40
3/4	3/8	3.25	3.65
1	3/8	4.65	5.30
2	3/8	6.15	6.80

HANSON FORCE FEED LUBRICATOR

Capacity One and One-half Pints



Operated mechanically from any moving part upon the engine (valve motion usually the most convenient). Positive in action under all conditions of weather and any kind of oil. Stops and starts with engine. When supply of lubricant is exhausted automatically disconnects and starts alarm bell. First-class workmanship and material in every particular. Body made of brass. Piston packed with spiral packing. All gears and ratchets are cut, insuring accuracy and long life. All parts interchangeable.

Price with alarm bell.....\$13.00

FORCE FEED PUMPS

For Feeding Boiler Compounds

Metal body, enameled or nickel plated, with sight feed and glass gauge.

Cap.....	1/4 gallon	1/2	1	1 1/2	2
Each.....	\$32.00	\$37.00	\$47.00	\$67.00	\$72.00

These pumps have been tested by the use of a great many different compounds, and in every case have given satisfactory results.

LUBRICATING PUMPS

Hills-McCanna



Fig. 50

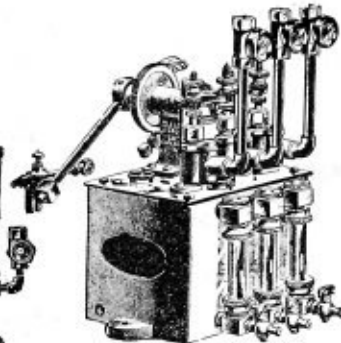


Fig. 60

Fig. 50. Single Pump with Glass Oil Holders, Sight Feed Attachment. Nickel Plated.

For marine, stationary, dynamo, fan, steering, traction engines, steam hammers, steam elevators, or any power requiring lubrication.

Capacity, one pint, price each.....\$16.00

Capacity, one quart, price each..... 25.00

Fig. 60. Sight Feed Pump, can furnish single or with compartments as desired.

PRICE LIST OF FIG. 60 WITH SIGHT FEED

1	Pint, Single	Metal Body.....	each \$ 20.00
1	Quart, Single	" "	30.00
1	Quart, Double	" "	40.00
1	1/2 Gallon, Single	" "	35.00
1	1/2 " Double	" "	45.00
1	" Single	" "	45.00
1	" Double	" "	55.00
1	" Triple	" "	65.00
1	" Quadruple	" "	75.00
1 1/2	" Single	" "	55.00
1 1/2	" Double	" "	65.00
1 1/2	" Triple	" "	75.00
1 1/2	" Quadruple	" "	85.00
1 1/2	" Five Feed	" "	95.00
2	" Single	" "	70.00
2	" Double	" "	80.00
2	" Triple	" "	90.00
2	" Quadruple	" "	100.00
2	" Five Feed	" "	115.00
2	" Six	" "	130.00
2	" Seven	" "	150.00
2	" Eight	" "	170.00
2	" Nine	" "	190.00

Sight Feed.....\$2.50

AIR COCKS

T Handle
Single Thread

Fig. 50

Lever Handle
Single Thread

Fig. 53

T Handle
Bibb Nose

Fig. 58

T Handle
Double Thread

Fig. 54

Lever Handle
Double Thread

Fig. 55

Lever Handle
Bibb Nose

Fig. 59

Size, inches.....	1/4	3/8	1/2	3/4
Fig. 50, Each.....	\$0.40	\$0.45	\$0.50	\$0.60
Fig. 54, Each.....	.55	.65	.75	.90
Fig. 53, Each.....	.55	.60	.65	.75
Fig. 58, Each.....	.70	.80	.90	1.05
Fig. 59, Each.....	.85	.95	1.05	1.15

STEAM GAUGE COCKS

T Handle
Female

Fig. 80

Lever Handle
With Union

Fig. 81

Size, inches.....	1/4	1/2
Fig. 80, Each, finished.....	\$0.75	\$0.75
Fig. 81, Each.....	\$1.50	1.65

STEAM GAUGE SYPHONS



Fig. C48



Fig. C49



Fig. C51



Fig. C50



Fig. C52

Figure.....	C48	C49	C51	C50	C52, Brass
Price Each.....	\$1.00	\$1.25	\$1.50	\$1.50	\$1.00

CYLINDER COCKS

Tee Handle

Long Shank

Lever Handle



PRICE EACH

Size Pipe Thread, in.....	1/4	3/8	1/2	3/4
Tee Handle, Long Shank.....	\$0.70	\$0.80	\$0.90	\$1.20
Lever " Long Shank.....	.85	.95	1.05	1.35

COMPRESSION GAUGE COCKS

No. 1 Without Stuffing
BoxNo. 2 With Stuffing
Box

Size, inches.....	1/4	1/2	3/4
No. 1 Without Stuffing Box.....	\$0.95	\$1.00	\$1.25
No. 2 With Stuffing Box.....	1.20	1.30	1.45

WEIGHTED GAUGE COCKS

"Register Pattern"



Size, inches.....	1/4	1/2	3/4
With Iron Ball, each.....	\$1.00	\$1.00	\$1.00

WATER GAUGES

Self-Cleaning



No.	Size, in.	Style	Rods	Glass, inches	Price Each
3-0	5/8	Bronzed	2	5/8x10	\$2.75
2-0	3/4	Polished	2	3/4x10	3.25
0	3/8	"	2	3/8x10	3.75
1	1/2	Bronzed	2	1/2x12	3.00
1 1/2	3/4	"	2	3/4x16	4.50
2	1 1/2	Polished	2	1 1/2x12	3.75
3	1 3/4	"	2	1 3/4x12	4.25
5	1 3/4	"	4	1 3/4x12	5.00
7	2 1/4	"	4	2 1/4x16	6.25
7 1/2	3 1/4	"	2	3 1/4x16	5.50
9 1/2	3 3/4	"	4	3 3/4x16	8.00

Nos. 3-0, 2-0, 1, 1 1/2 and 2 have iron wheels.
The balance have wood wheels.

GENUINE SCOTCH GAUGE GLASSES

Genuine Scotch



PRICE PER DOZEN

Length, inches	EXTERNAL DIAMETER, INCHES			
	1/2 to 3/4	3/4	1	1 1/4
10	\$3.00	\$3.60	\$ 5.04	\$ 6.12
11	3.24	3.96	5.64	6.72
12	3.60	4.32	6.12	7.32
13	3.84	4.80	6.60	7.92
14	4.20	5.16	7.08	8.52
15	4.44	5.52	7.56	9.12
16	4.80	5.88	8.16	9.72
17	5.04	6.24	8.64	10.32
18	5.40	6.60	9.12	10.92
19	5.64	7.08	9.60	11.52
20	6.00	7.44	10.20	12.12
22	6.60	8.16	11.16	13.44
24	7.20	8.88	12.12	14.64
30	9.00	11.16	15.24	18.24
36	10.80	13.44	18.24	21.96
48	14.52	18.00	24.36	29.16
60	18.12	22.56	30.48	36.48
72	21.84	27.12	36.48	43.80

GAUGE GLASS WASHERS



For 1/2 inch to 1 inch Glasses

Square Flange, per pound.....\$1.25
Round " " 1.75

Size, inches..... 1/2 3/4 1 1 1/4 1 1/2
Price per dozen....\$0.15 .20 .25 .30 .35

JELCO GAUGE GLASS CUTTERS



Cuts a perfect circle; cutter wheel is easily removed;
cuts longer glass than any other.

Price, each.....\$2.00

CHESTERTON'S GAUGE GLASS CUTTERS



Price each, complete.....\$2.00

"FAVORITE" GAUGE GLASS CUTTERS



Price each.....\$0.50

OIL CUP GLASSES



Cylindrical



Urn-Shaped

No.	Outside Diameter of Cylindrical Glasses, inches	Height of Cylindrical Glasses, inches	Outside Diameter at Upper End of Urn-Shaped Glasses, inches	Height of Urn-Shaped Glasses, inches	Cylindrical or Urn-Shaped Glasses, Each	Cork Washers, Per Dozen
000	1	1 3/4	1 1/4	1 1/4	\$0.05	\$0.15
00	1 1/4	1 3/4	1 1/4	1 1/4	.06	.18
0	1 1/2	1 3/4	1 1/4	1 1/4	.08	.24
1	1 3/4	1 3/4	1 1/4	1 1/4	.10	.30
1 1/2	1 3/4	1 3/4	1 1/4	1 1/4	.12	.36
2	2 1/4	1 3/4	1 1/4	1 1/4	.12	.40
2 1/2	2 1/4	1 3/4	1 1/4	1 1/4	.12	.45
3	2 1/4	1 3/4	1 1/4	1 1/4	.12	.50
4	3 1/4	1 3/4	1 1/4	1 1/4	.15	.60
5	3 1/4	1 3/4	1 1/4	1 1/4	.15	.75
6	4 1/4	1 3/4	1 1/4	1 1/4	.15	.75
7	4 1/4	1 3/4	1 1/4	1 1/4	1.50	1.50

PRESSURE AND VACUUM GAUGES

Graduated up to 500 Pounds



BOURDON SINGLE SPRING

Prices, Including Cock

Dial, inches	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	Brass Deep Case, O. G. or Oct. Ring
12	\$50.00	\$51.50	\$75.00	\$80.00
10	32.00	33.00	40.00	44.00
8 1/2	22.00	22.75	30.00	33.50
6 3/4	16.00	16.60	20.00	23.00
6	13.00	13.50	16.00	18.50
5 1/2	10.00	10.25	12.00	13.75
5	8.00	8.20	11.00	12.50
4 1/2	8.00	8.20	10.00	11.50
3 1/2	7.00	7.18	9.00	10.25
3	6.00	6.15	8.00	9.25
2 1/2	6.00	6.15	8.00	9.25
2	6.00	6.15	8.00	9.25

Iron case gauges with spun brass jacket sold at brass case list and discount.

Nickel plated gauges and gauges larger than 12-inch dial quoted upon application.

BOURDON DOUBLE SPRING

Prices, Including Cocks.

Dial, inches	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	Brass Deep Case, O. G. or Oct. Ring
12	\$55.00	\$56.50	\$80.00	\$85.00
10	37.00	38.00	45.00	49.00
8 1/2	25.00	25.75	34.00	37.50
6 3/4	18.00	18.60	22.00	25.00
6	15.00	15.50	18.00	20.75
5 1/2	12.00	12.25	14.00	16.25
5	11.00	11.20	13.00	15.00
4 1/2	10.00	10.20	12.00	13.75

FARM ENGINE GAUGES

This gauge is especially adapted for traction engines, having but one short spring and is rigid and suitable for hard service, on rough roads, etc.



Dial, inches	Iron Case, Brass Ring	Iron Case, N. P. Ring
5 1/2	\$10.00	\$10.25
5	8.00	8.20
4 1/2	8.00	8.20
4	7.00	7.18

COMMON STEAM WHISTLES

Brass



Fig. 4

Without Valve



Fig. 5

With Side Valve

PRICES

Diameter of Bell, inches	Size of Steam Pipe, inches	Whistle, Fig. 4	Whistle, Fig. 5
1	1/4	\$ 2.20	\$ 3.10
1 1/4	3/8	2.75	3.75
1 1/2	3/8	3.00	4.00
2	1/2	4.35	5.50
2 1/2	3/4	5.25	6.50
3	1	7.25	8.50
3 1/2	1 1/4	9.50	11.50
4	1 1/2	12.00	15.00
5	2	19.00	22.50
6	2 1/2	24.00	33.00
8	3	70.00	95.00
10	3	125.00	175.00

In ordering, state figure and diameter of bell.

SINGLE BELL CHIME STEAM WHISTLES



Fig. 1

Without Valve



Fig. 2

With Upright Valve, Locomotive Style



Fig. 3

With Side Valve

Diameter of Bell	Size of Steam Pipe	Fig. 1	Fig. 2	Fig. 3
1 1/2 inch	3/4 inch	\$ 4.50	.....	\$ 6.00
2 1/2 "	1 "	5.00	.....	8.00
2 3/4 "	1 1/4 "	7.50	.....	11.00
3 "	1 1/2 "	9.50	.....	14.00
4 "	2 "	15.00	\$20.00	18.00
5 "	2 1/2 "	28.00	35.00	35.00
6 "	3 "	42.00	50.00	50.00
8 "	3 1/2 "	95.00	.....	110.00
10 "	4 "	190.00	.....	210.00
12 "	5 "	280.00	.....	300.00

THREE-BELL CHIME WHISTLES

PRICES



No. 1. Composed of one each, 1 1/2, 2 and 2 1/2 inch Whistles. Size of steam pipe, 1 inch. \$ 22.00

No. 2. Composed of one each, 3 1/2, 4 and 4 1/2 inch Whistles. Size of Steam pipe, 1 1/2 in. \$ 40.00

No. 3. Composed of one each, 5, 6 and 8-inch Whistles. Size of steam pipe, 3-inch. \$109.00

Standard size whistles are furnished with the above, bells of which are in length about twice the diameter.

BRISTOL'S RECORDING GAUGES

FOR ALL COMMERCIAL RANGES OF PRESSURE AND VACUUM



Original Form Type



Round Form Type

These Recording Gauges have been adapted to hundreds of different applications requiring a great variety of charts, ranges and clock speeds. Special charts have been engraved to suit the various requirements, until now the list numbers up into the thousands. It is, therefore, impractical to show the list of charts in this catalog. We have them, however, for every purpose, high or low pressures, for gas, steam, water, air, etc., and will be glad to recommend the one best suited to your requirements upon receipt of inquiry, which should always specify the maximum and minimum pressure or vacuum.

ORIGINAL FORM TYPE

12 inch dial, solid bronze case, full nickel finish.....	\$60.00
12 " " enamel finish, nickel door only.....	55.00
8 " " solid bronze case, full nickel finish.....	50.00
8 " " enamel finish, nickel door only.....	45.00

ROUND FORM TYPE

8 inch dial, full nickel finish.....	\$40.00
8 " " enamel finish, nickel door only.....	35.00
6 " " full nickel finish.....	30.00
6 " " enamel finish, nickel door only.....	25.00

MOISTURE PROOF CASES

For many uses Protection cases have proven very valuable in connection with these recording instruments. We furnish them either complete, including gauge or case only.

8 inch chart, complete with gauge.....	\$62.00
8 " " case only.....	20.00
12 " " complete with gauge.....	73.00
12 " " case only.....	25.00

THE BEYERS WATCHMAN'S PORTABLE CLOCK

ABSOLUTELY "TAMPER-PROOF"

Embosses your firm name on the paper dial so that no two clocks can produce the same record, making it impossible for the watchman to get keys from other clocks and make false reports.

Approved by the National Board of Fire Underwriters and other associations.



5 in. Dial meter, 1 1/4 in. thick.



2 in. deep, 2 1/4 in. wide,
6 in. high, weighs
2 lbs.

Price of Clock with year's supply of dials.....\$13.75

Price of Lock Box Stations..... 1.95

Price of Extra Dials (a year's supply)..... 3.15

Made of aluminum and enclosed in leather case for extra protection; weighs 2 1/2 pounds.

NEWMAN WATCHMAN'S PORTABLE CLOCK

Approved by the National Fire Protection Association for Use under the Rules and Requirements of the National Board of Fire Underwriters Covering Portable Watch Clocks

CANNOT BE TAMPERED WITH

The watches are made in two sizes, 9 keys and 16 keys. The 9 key size is only for nine stations, while the 16 key size can be arranged for any number of stations.

The following are the principal advantages of this clock:

1st. To duplicate the key our dies and matrix *must* be used. Keys cannot be purchased without application by the proper authorities.

2d. The case is made of aluminum, for lightness and to prevent tarnishing or injury from acids or grease.

3d. The dial is arranged for twenty-four hours. This gives a record for the Sunday registering when necessary.



Key

Showing front view of watch with strap. Keys are made of metal, which will neither corrode nor rust. The seals cover the screws that fasten the box to the wall.



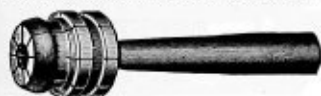
Price complete with nine stations.....\$65.00

Price complete with 16 stations..... 75.00

SPRING TUBE EXPANDERS

Prosser's Pattern

Always state thickness of tube sheet when ordering.



Outside Diameter, Inches	Price Each	Outside Diameter, Inches	Price Each
1	\$11.00	3	\$22.00
1 1/4	11.00	3 1/4	26.00
1 1/2	11.00	3 1/2	30.00
1 3/4	11.00	4	33.00
2	12.00	4 1/2	37.00
2 1/4	13.00	5	42.00
2 1/2	15.00	6	60.00
2 3/4	18.00	...	.....

SPECIAL IDEAL SELF-FEED ROLLER TUBE EXPANDER

For Locomotive and Marine Service

(Worked by hand or reversible air drill without any change.)

Full description sent on request.



Rolls cannot drop out either to inside or outside if the mandrel is removed. No cap screws to break off or work loose. Rolls double the length of ordinary expanders and reversible, can be replaced instantly. Guard can be removed to work close to boiler shell or rivet line.

Diam., inches	Price Each	Diam., inches	Price Each	Diam., inches	Price Each
1	\$12.00	2	\$16.00	3	\$26.00
1 1/4	12.00	2 1/4	18.00	3 1/4	29.00
1 1/2	12.00	2 1/2	18.00	3 1/2	32.00
1 3/4	16.00	2 3/4	20.00	3 3/4	35.00
1 7/8	16.00	2 7/8	23.00	4	38.00

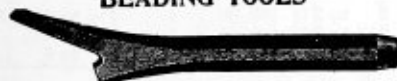
WIEDEKE ROLLER TUBE EXPANDER



Body and collar are one piece, preventing collar and pin breaking or getting lost.

Diam., inches	Price Each	Diam., inches	Price Each	Diam., inches	Price Each
1	\$10.00	2	\$10.00	3 1/2	\$23.00
1 1/4	10.00	2 1/4	12.00	3 3/4	25.00
1 1/2	10.00	2 1/2	12.00	4	30.00
1 3/4	10.00	2 3/4	14.00	4 1/4	35.00
1 7/8	10.00	2 7/8	14.00	4 1/2	40.00
2	10.00	3	16.00	5	50.00
2 1/4	10.00	3 1/4	18.00	5 1/2	55.00
2 1/2	10.00	3 1/2	20.00	6	60.00

BEADING TOOLS



Each.....\$0.75

DAYTON ROLLER EXPANDERS

Boss Pattern



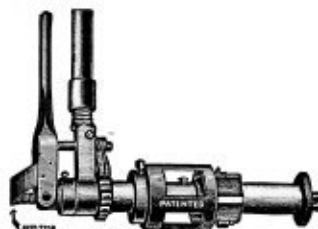
Diam. in. In.	Price Complete	Diam. in. In.	Price Complete	Diam. in. In.	Price Complete	Diam. in. In.	Price Complete
1	\$11.00	1 1/4	\$11.00	2 3/8	\$16.50	3	\$20.00
1 1/8	11.00	1 3/8	12.50	2 1/2	17.00	3 1/8	22.00
1 1/4	11.00	2	13.00	2 3/4	18.00	3 1/4	24.00
1 1/2	11.00	2 1/4	15.00	2 7/8	19.00	3 3/8	26.00
1 3/4	11.00	2 3/4	15.50	3	20.00	4	28.00

IDEAL SELF-FEED TUBE CUTTER

Full descriptive circular sent on request.

Will cut off new or old tubes inside or outside of the boiler head.

Operated by one man. Made of steel, strong, simple and durable.



Size, in.	2, 2 1/4, 2 1/2	2 3/4	3, 3 1/4	3 1/2, 4	4 1/2	5, 6
Price	\$14.00	16.00	20.00	22.00	30.00	32.00

BUTMAN PATENT FLUE CLEANER RODS

These rods are made of white ash, 1 1/2 inches in diameter, sockets and joints of malleable iron, and connecting balls of drop forged steel.

The socket in first section is tapped to receive 3/8 inch pipe. Class B recommended where there is plenty of room in front of boiler, and Classes A and C where space is more limited.



No.	Length 1st Section	Length 2nd Section	Length Over All	Price
A 1	6 ft. 6 in.	6 ft. 6 in.	13 ft.	\$5.76
2	5 " 6 "	5 " 6 "	11 "	5.60
3	4 " 6 "	4 " 6 "	9 "	5.44
4	15 "	6 "	21 "	6.40
5	13 "	6 "	19 "	6.24
B 6	11 "	6 "	17 "	6.08
7	10 "	5 "	15 "	5.90
8	8 "	5 "	13 "	5.76

Class C

No.	Length 1st Section	Length 2nd Section	Length 3d Section	Length Over All	Price
9	7 ft.	7 ft.	7 ft.	21 ft.	\$8.40
10	6 " 4 in.	6 " 4 in.	6 " 4 in.	19 "	8.24
11	5 " 8 "	5 " 8 "	5 " 8 "	17 "	8.08
12	5 "	5 "	5 "	15 "	7.92
13	4 " 4 "	4 " 4 "	4 " 4 "	13 "	7.76
14	3 " 8 "	3 " 8 "	3 " 8 "	11 "	7.60
15	3 "	3 "	3 "	9 "	7.44

Order by number and give diameter and length of tubes.

COMBINATION FLUE BRUSH AND SCRAPER



Piley's

End or claw is contracted so it will enter flue by turning rod or handle, and by turning it in the opposite direction end is expanded to fit tube perfectly. The brush following leaves the tubes thoroughly cleaned.

Price per inch.....\$1.00

THE "ENGINEERS' FAVORITE" FLUE SCRAPER



Operates the same as the combination without a flue brush. Sizes are for outside diameter of tube from 1 3/4 to 6 inches.

Price per diameter inch.....\$1.00

Smaller sizes than 2 inches same price as 2 inches.

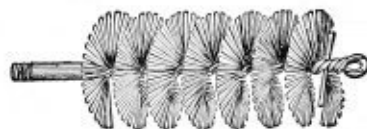
EXPANSION FLUE BRUSHES



So arranged that the open space between the sections does not extend the entire length of the brush, thus cleaning the whole of the flue each time it is pushed through. Made in sizes from 1 1/2 to 9 inches.

Price per inch.....\$1.00

FLAT STEEL WIRE TUBE BRUSHES



Made either black or tinned. In all sizes from 1 to 6 inches.

Price per inch.....\$1.00

GLOBE FLUE SCRAPER



Made of Best Malleable Iron and Tool Steel.

Is self-expanding. Has tool steel shearing edges. Works on a wedge cut principle. Gets under the scale and removes it instead of riding over it.

Size	Each	Size	Each
2 inches	\$2.50	3 1/2 inches	\$4.25
2 1/2 "	3.00	4 "	5.00
3 "	3.75	4 1/2 "	5.60

THOMPSON'S SOOT EJECTOR

Will Clean 80 Tubes in Five to Six Minutes

The tip is adjustable and interchangeable; can be taken out and cleaned if necessary.



No.	Size of Tubes Inches	Size of Hose Used and Steam Connections, Inches	Head Only	Head, Handle, Tip and Pipe
1	2-2 1/2	1 1/2	\$10.00	\$12.00
2	3-3 1/2	2 1/2	11.00	13.00
3	4-4 1/2	3 1/2	12.00	14.00

Eight or ten feet of steam hose will be sufficient for two boilers if connected between them, and twenty feet for four boilers.

THE "MAGIC" FLUE BLOWERS



Standard sizes for horizontal boilers will have 18 inches of pipe between the conical head and valve. If distance from boiler front to tube sheet should exceed that, please state the length required.

For upright boilers, give diameter of firebox and height from tube sheet to bottom of furnace door. For locomotive boilers, state length of firebox.

No.	Size of Tube, Outside Diameter, Inches	Price Each with Clamps and Nipples	No.	Size of Tube, Outside Diameter, Inches	Price Each with Clamps and Nipples
1	2 to 2 1/2	\$5.00	4	3 1/2 to 3 3/4	\$ 8.75
2	2 1/2 to 2 3/4	6.25	5	4 to 4 1/2	10.00
3	3 to 3 1/4	7.50	6	5 to 6	12.50

In Ordering, Always State Outside Diameter of Tubes

PENBERTHY AUTOMATIC INJECTOR.



Stock Injector. Style Left and Back.
Suction Left, Discharge Back.

Size.	Price.	Horse Power Based on Ordinary Tub. Boiler.	Horse Power Based on 30 lbs. Water per H. P. per Hour.	Pipe Connections, inches.	Capacity per Hour, 1 to 3 feet Lift, 60 to 85 lbs. Steam Pressure.	
					Maximum, gallons.	Minimum, gallons.
O	\$15.00	3 to 6	4 to 8	1/4	60	40
OO	16.00	4 " 8	6 " 12	3/8	80	55
A	18.00	8 " 16	10 " 20	1/2	135	70
AA	20.00	12 " 22	15 " 30	5/8	180	100
B	25.00	17 " 32	22 " 45	3/4	260	140
BB	30.00	20 " 45	25 " 60	7/8	355	170
C	40.00	40 " 65	45 " 80	1	475	300
CC	45.00	45 " 80	50 " 100	1 1/4	600	350
D	55.00	50 " 100	60 " 135	1 1/2	800	425
DD	60.00	75 " 135	85 " 165	1 3/4	1,000	525
E	75.00	100 " 180	125 " 235	1 1/2	1,400	800
EE	90.00	115 " 255	150 " 320	1 3/4	1,900	900
F	110.00	160 " 320	200 " 400	2	2,400	1,300
FF	125.00	200 " 400	250 " 500	2 1/4	3,000	1,600
G	150.00	300 " 500	325 " 600	2 1/2	3,600	2,000
GG	200.00	375 " 600	400 " 750	2 3/4	4,200	2,500

N. B.—Where Injectors are ordered by size connections, we always send the size having the larger capacity.

AUTO-POSITIVE PENBERTHY INJECTOR.

This injector differs materially from any other automatic injector ever before placed on the market, being constructed on new principles, **having but 5 working parts**, and combining the features of a positive with those of an automatic injector. By this combination it is enabled to handle much hotter water and work on higher steam pressures than other automatic injectors.

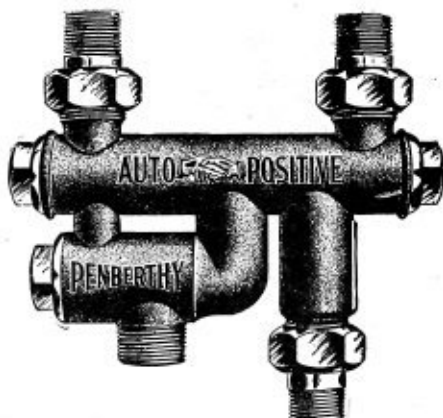
It will start on a short lift at 15 to 20 lbs., according to size, and operate to 190 to 200 lbs. pressure, water 74 degrees Fahrenheit, or summer temperature. At winter temperature works to 240 lbs. pressure.

It will handle a hot water supply as follows, from a head :

135° to 140° Fahr.,	according to conditions,	at 75 to 100 lbs. pressure.
130° to 135° "	" " " "	" 50 to 120 " "
118° to 120° "	" " " "	" 25 to 150 " "
98° to 100° "	" " " "	" 18 to 175 " "

By placing stop cock on overflow, water 6 to 8 degrees hotter can be handled.

VERTICAL LIFT.—It lifts from 3 feet at 200 lbs. pressure to 20 to 23 feet (according to size and conditions), its best lifting pressures being between the pressures 65 and 100 lbs.

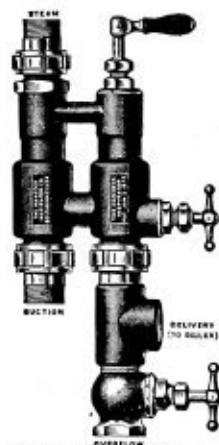


Automatic and Restarting for High Pressures and Hot Water Supply.

Size.	Price.	Pipe Connections.			Capacity per Hour, 75 to 100 lbs. Steam, 3 feet Lift.		Horse Power, Allowing 7 1/2 to 8 gallons per H. P. per Hour.
		Steam.	Suction.	Delivery.	Maximum.	Minimum.	
112	\$18.00	3/8	3/8	3/8	120	40	5 to 15
113	20.00	1/2	1/2	1/2	200	60	7 " 25
115	30.00	3/4	3/4	3/4	400	130	16 " 50
117	45.00	1	1	1	675	225	28 " 85
119	60.00	1 1/4	1 1/4	1 1/4	1,125	375	47 " 145
121	90.00	1 1/2	1 1/2	1 1/2	2,000	700	87 " 265
123	125.00	2	2	2	3,000	1,000	125 " 400
125	200.00	2 1/2	2 1/2	2 1/2	4,200	1,500	200 " 600

THE HANCOCK INSPIRATOR

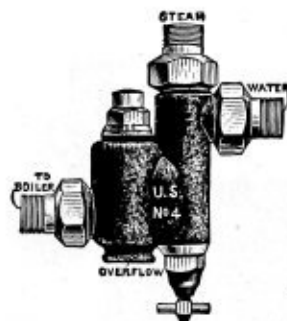
"Stationary" Type



For Stationary, Marine, and Portable Boilers

Sizes	Prices "Stationary" Type	PIPE CONNECTIONS			Capacity per Hour with 60 lbs Steam Pres- sure, gals.	HORSE POWER	
		Steam	Suction and De- livery	Over- flow		For the Ordinary Type of Boiler and Engine	On a basis of 30 lbs. Evaporation per H. P. per Hour
7 $\frac{1}{2}$	\$ 16.00	3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{4}$	60	4 to 6	5 to 8
8 $\frac{3}{4}$	18.00	3 $\frac{3}{8}$	1 $\frac{1}{2}$	3 $\frac{3}{8}$	90	6 to 8	8 to 15
10	20.00	3 $\frac{3}{8}$	1 $\frac{1}{2}$	3 $\frac{3}{8}$	120	8 to 15	15 to 25
12 $\frac{1}{2}$	25.00	1 $\frac{1}{2}$	3 $\frac{3}{4}$	1 $\frac{1}{2}$	220	15 to 30	25 to 35
15	30.00	1 $\frac{1}{2}$	3 $\frac{3}{4}$	1 $\frac{1}{2}$	300	30 to 40	35 to 60
17 $\frac{1}{2}$	40.00	3 $\frac{1}{4}$	1	3 $\frac{1}{4}$	420	40 to 60	60 to 75
20	45.00	3 $\frac{1}{4}$	1	3 $\frac{1}{4}$	540	60 to 75	75 to 100
22 $\frac{1}{2}$	55.00	1	1 $\frac{1}{4}$	1	720	75 to 90	100 to 130
25	60.00	1	1 $\frac{1}{4}$	1	900	90 to 120	130 to 175
30	75.00	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1260	120 to 165	175 to 235
35	90.00	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1740	165 to 230	235 to 300
40	110.00	1 $\frac{1}{2}$	2	1 $\frac{1}{2}$	2230	230 to 300	300 to 400
45	125.00	1 $\frac{1}{2}$	2	1 $\frac{1}{2}$	2820	300 to 375	400 to 500
50	150.00	2	2 $\frac{1}{2}$	2	3480	375 to 500	500 to 650
55	175.00	2	2 $\frac{1}{2}$	2	3650	500 to 600	650 to 700

U. S. AUTOMATIC INJECTORS



Regular or Stock Style

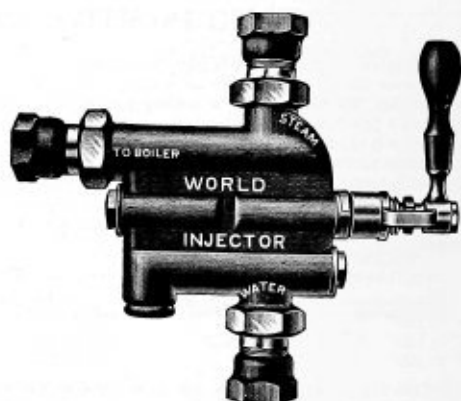


Special "D" Style

Size	All Pipe Connections, inches	Capacity, Gallons per Hour		Horse Power	Price
		Max.	Min.		
00	3 $\frac{1}{4}$	36	15	1 to 4	\$13.00
0	3 $\frac{1}{4}$	65	28	3 " 8	14.00
1	3 $\frac{1}{4}$	90	40	6 " 10	16.00
2	3 $\frac{1}{4}$	125	60	8 " 15	18.00
3	3 $\frac{1}{4}$	170	75	15 " 20	20.00
4	3 $\frac{1}{4}$	250	125	20 " 30	25.00
5	3 $\frac{1}{4}$	340	140	30 " 40	30.00
6	1	475	250	40 " 60	40.00
7	1 $\frac{1}{4}$	575	300	60 " 70	45.00
8	1 $\frac{1}{4}$	750	350	70 " 95	55.00
9	1 $\frac{1}{4}$	920	450	95 " 120	60.00
10	1 $\frac{1}{2}$	1,350	675	120 " 165	75.00
11	1 $\frac{1}{2}$	1,750	850	165 " 230	90.00
12	2	2,275	1,000	230 " 295	110.00
13	2	2,820	1,300	295 " 375	125.00
14	2	3,400	1,700	375 " 460	150.00
15	2 $\frac{1}{2}$	3,650	1,800	460 " 500	175.00
16	2 $\frac{1}{2}$	4,000	1,950	500 " 600	200.00

WORLD INJECTORS

Double Tube



Size	Size of Con- nections All Around	80 POUNDS STEAM PRESSURE		Price
		Gallons per Hour	Horse Power	
30	3 $\frac{1}{2}$	120	10 to 15	\$ 20.00
40	3 $\frac{1}{4}$	220	15 " 25	25.00
50	3 $\frac{1}{4}$	300	25 " 35	30.00
60	1	420	35 " 50	40.00
70	1	540	45 " 60	45.00
80	1 $\frac{1}{4}$	720	60 " 95	55.00
90	1 $\frac{1}{4}$	900	85 " 120	60.00
100	1 $\frac{1}{2}$	1,260	120 " 165	75.00
110	1 $\frac{1}{2}$	1,740	165 " 230	90.00
120	2	2,230	230 " 295	110.00
130	2	2,820	295 " 375	125.00
140	2	3,480	375 " 460	150.00
150	2 $\frac{1}{2}$	3,600	460 " 500	175.00
160	2 $\frac{1}{2}$	4,000	500 " 600	200.00

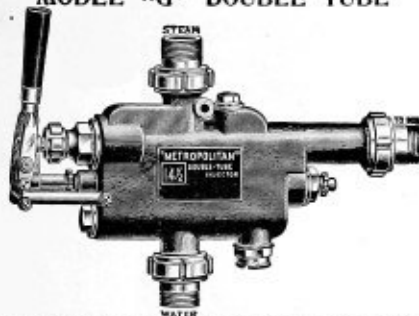
METROPOLITAN INJECTORS

MODEL "N" AUTOMATIC



Size, inches	Price Each	Size of Pipe Connections, inches	Capacity per Hour, 80 lbs. Steam Pressure, 2 ft. Lift, gals.	Horse Power
2	\$ 15.00	3/4	60	4 to 6
3	16.00	1	80	6 to 8
3 1/2	18.00	1 1/4	120	8 to 15
4	20.00	1 1/2	165	15 to 20
5	25.00	1 3/4	250	20 to 30
6	30.00	2	350	30 to 45
7	40.00	2 1/4	500	45 to 65
8	45.00	2 1/2	600	65 to 80
9	55.00	2 3/4	800	80 to 100
10	60.00	3	1,000	100 to 130
11	75.00	3 1/2	1,300	130 to 170
12	90.00	4	1,750	170 to 230
13	110.00	4 1/2	2,300	230 to 300
14	125.00	5	2,850	300 to 375

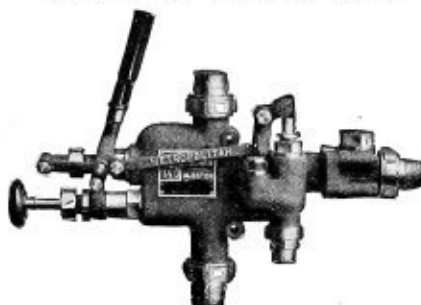
MODEL "G" DOUBLE TUBE



Will work from 20 to 250 lbs. steam pressure without adjustment under varying steam pressures. Takes feed water to 150 degrees. Lifts water readily 20 feet. Will deliver into boiler at 300 degrees F.

Size, inches	Price Each	Size of Pipe Connections, inches	Capacity per Hour 80 lbs. Steam Pressure, 2 ft. Lift, gals.	Horse Power
2 1/2	\$ 18.00	1 1/2	120	8 to 15
3 1/2	20.00	2	165	15 to 20
4 1/2	25.00	2 1/2	250	20 to 30
5 1/2	30.00	3	350	30 to 45
6 1/2	40.00	3 1/2	500	45 to 65
7 1/2	45.00	4	600	65 to 80
8 1/2	55.00	4 1/2	800	80 to 100
9 1/2	60.00	5	1,000	100 to 130
10 1/2	75.00	5 1/2	1,300	130 to 170
11 1/2	90.00	6	1,750	170 to 230
12 1/2	110.00	6 1/2	2,300	230 to 300
13 1/2	125.00	7	2,850	300 to 375
14 1/2	150.00	7 1/2	3,500	375 to 500
16 1/2	200.00	8 1/2	4,200	500 to 650
17 1/2	250.00	9 1/2	4,700	650 to 775
18 1/2	300.00	10 1/2	5,500	775 to 950

MODEL "O" DOUBLE TUBE



Sizes	Price Each	Size Pipe Connections, inches	Capacity per Hour 100 Lbs. Steam Pressure, gallons	Horse Power
7 1/2	\$ 40.00	1	525	45 to 65
8 1/2	45.00	1 1/4	625	65 to 80
9 1/2	55.00	1 1/2	835	80 to 100
10 1/2	60.00	1 3/4	1040	100 to 130
11 1/2	75.00	2	1350	130 to 170
12 1/2	90.00	2 1/4	1800	170 to 230
13 1/2	110.00	2 1/2	2350	230 to 300
14 1/2	125.00	2 3/4	2900	300 to 375
15 1/2	150.00	3	3600	375 to 500
16 1/2	200.00	3 1/2	4300	500 to 650
17 1/2	250.00	4	4900	650 to 800
18 1/2	300.00	4 1/2	5500	800 to 1000

MODEL "T" FLANGED



Sizes	Price Each	Size Pipe Connections, inches	Capacity per Hour 100 Lbs. Steam Pressure, gallons	Horse Power
11 1/2	\$ 85.00	1 1/2	1315	130 to 170
12 1/2	100.00	1 3/4	1800	170 to 230
13 1/2	120.00	2	2350	230 to 300
14 1/2	135.00	2 1/4	2900	300 to 375
15 1/2	165.00	2 1/2	3600	375 to 500
16 1/2	220.00	2 3/4	4300	500 to 650

"XL-96" IMPROVED EJECTOR

Syphon or Steam Jet Pump. Lifts 20 to 25 Feet. Elevates 50 to 75 Feet



*Unless ordered in brass, sizes 7 to 9 will be shipped with iron body, brass jets and steam connection, and size 10 all iron except jets.

The jets in all sizes are made of a special hard metal, insuring good wearing qualities.

Size, Number	PIPE CONNECTIONS		Cap. per Hour, 40 to 65 lbs. Steam, 3 ft. Lift, gals.	Price, All Brass, Each	Price, Iron Body, Brass Jets, Each
	Steam	Suction and Delivery			
1	3/8	1/2	240	\$ 8.00	Sizes 1 to 4 made in all brass only
2	1/2	3/4	500	10.00	
3	3/4	1	840	15.00	
4	1	1 1/4	1,350	20.00	\$20.00
5	1 1/4	1 1/2	1,950	25.00	
6	1 1/2	2	3,500	35.00	
7*	1 1/2	2 1/2	5,700	50.00	40.00
8*	2	3	9,500	70.00	50.00
9*	2	3 1/2	13,600	105.00	70.00
10*	2 1/2	4	18,400	145.00	95.00

THE H-D. "1898" EJECTOR

Model P



Size Nos. 6, 7 and 8 have iron body, balance brass.

Size No. 9 has brass tubes, balance iron.

Size Nos. 6, 7, 8 and 9 made entirely of brass, to order.

Special all-iron ejectors made to order.

Sizes	PIPE CONNECTIONS		Capacity per Hour with 50 lbs. Steam Pressure	Prices Model P.
	Steam	Suction and Delivery		
1	3/8	1/2	250 gals.	\$ 8.00 Brass
2	1/2	3/4	500 "	10.00 "
3	3/4	1	960 "	15.00 "
4	1	1 1/4	1,300 "	20.00 "
5	1 1/4	1 1/2	2,000 "	25.00 "
6	1 1/4	2	4,000 "	35.00 Iron
7	1 1/2	2 1/2	8,000 "	45.00 "
8	2	3	11,000 "	55.00 "
9	2 1/2	4	15,000 "	70.00 "

HANCOCK EJECTOR OR JET PUMP

Sizes 1, 2, 3 and 4 are made entirely of brass; sizes 5, 6 and 7 have iron bodies and brass unions for steam and suction; sizes 8, 9, 10 and 11 have iron bodies with brass unions for steam only.

Special—All Iron Ejectors made to order.

No.	Price Each	PIPE CONNECTIONS		Capacity, Gals. per Hour, Steam Pressure 60 Pounds
		Steam, inches	Suction and Delivery, inches	
1 Brass	\$ 8.00	1/4	1/2	244
2 "	10.00	3/8	3/4	550
3 "	15.00	1/2	1	977
4 "	20.00	3/4	1 1/4	1,525
5 Iron	25.00	3/4	1 1/2	2,200
6 "	35.00	1	2	3,900
7 "	45.00	1 1/4	2 1/2	6,000
8 "	55.00	1 1/2	3	8,800
9 "	70.00	2	4	15,000
10 "	110.00	2 1/2	5	24,000
11 "	160.00	2 1/2	6	35,000

BLAKESLEE STEAM JET PUMPS

Designed for supplying water tanks at mills, factories, and for pumping water or other liquids at mines, stone quarries, tanneries, oil works, etc., but not for boiler feeding.



PRICES OF PUMPS WITH BRASS FITTINGS

No.	Size of Pump, inches	Suction Pipe, inches	Discharge Pipe, inches	Steam Pipe, inches	Steam Opening, inches	Capacity per min., gallons	Price Each	H. P. of Boiler Required
1	1	3/4	1/2	3/8	3/8	8	\$ 8.00	2
2	1 1/4	1	3/4	1/2	3/8	15	10.00	3
3	1 1/2	1 1/4	1	3/4	1/2	20	12.00	4
4	2	1 3/4	1 1/4	1	3/4	30	14.00	6
5	2 1/2	2	1 3/4	1 1/4	1	40	16.00	8
6	3	2 1/2	2	1 3/4	1 1/4	50	20.00	10
7	3 1/2	3	2 1/2	2	1 3/4	60	24.00	15

We can furnish brass pumps at an additional cost.

Steam Pressure—Twenty-five pounds ought always to form the suction, and higher pressure must be carried according to height of discharge, at about the rate of one pound to the foot.

Capacity—The capacities, as given in table herein are the normal capacities at fifty pounds boiler pressure. Greater steam pressure gives increased capacity.

For other Jet Pumps see pages 223 224.

DRIVE WELL JET PUMPS



This style of Jet Pump is especially intended for use in driven, drilled or bored wells, where it might be impossible to use the ordinary Jet Pump.

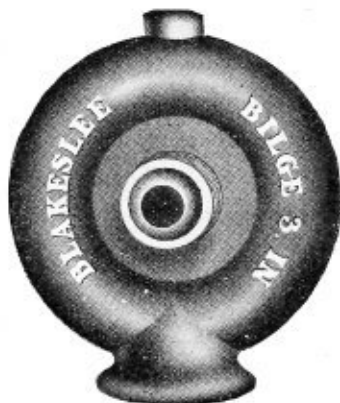
No.	Suction, inches	Delivery, inches	Steam, inches	Size Pipe will go in, inches	Gallons per Hour	Price
1	1	3/4	1/2	3	500	\$ 7.50
2	1 1/4	1	3/4	3 1/2	1,000	10.00
3	1 1/2	1 1/4	1	4	1,500	12.50
4	2	1 3/4	1 1/4	5	2,000	15.00
5	3	2	1 3/4	.....	3,800	25.00

AMERICAN EJECTORS



No.	Suction, inches	Delivery, inches	Steam Connection, inches	Gallons per Hour	Price
000	3/8	3/4	1/4	150	\$ 6.00
00	1/2	3/4	1/4	250	8.00
0	3/4	1 1/2	3/8	375	9.00
1	1	3/4	1/2	750	10.00
2	1 1/4	1	3/4	1,000	15.00
3	1 1/2	1 1/2	1	1,500	20.00
4	2	1 3/4	1 1/4	2,000	25.00
5	2 1/2	2	1 3/4	4,000	35.00
6	3	2 1/2	2	8,000	40.00
7	4	3	2 1/2	11,000	50.00
8	5	4	2 1/2	15,000	65.00
9	6	5	2 1/2	45,000	175.00

BLAKESLEE BILGE PUMPS



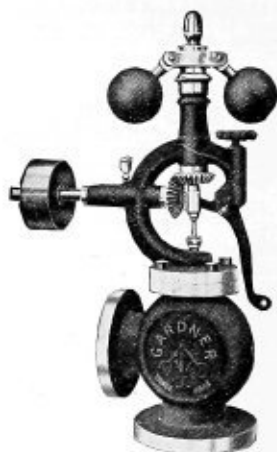
Adapted to raising a large amount of water with little steam. Not designed to raise water to great heights, but make from eighteen to twenty feet suction. They do the work altogether by suction, and should be set so discharge opening will be about on a line with point of discharge.

No.	Size of Pump, inches	Suction Pipe, inches	Discharge Pipe, inches	Steam Pipe, inches	Capacity per Hour with Fifty Pounds Steam	Price
8	1 1/2	1 1/2	1 1/4	3/4	2400 gallons	\$10.00
9	2	2	1 1/2	1	3000 "	14.00
10	2 1/2	2 1/2	2	1 1/4	3600 "	16.00
11	3	3	2 1/2	1 1/2	4500 "	20.00
12	4	4	3	2	8000 "	30.00

GARDNER ENGINE GOVERNORS



Class A, Spring Governor



Class B, Standard Governor

Standard Class A Governor; has automatic safety stop and speeder. Made in sizes $1\frac{1}{4}$ to 16 inch inclusive.
Standard Class B Governor; has speeder and sawyer's lever, but no automatic stop. Made in sizes $\frac{3}{4}$ to 10 inch inclusive.

Spring Class A Governor; has speeder, sawyer's lever and automatic safety stop.

Spring Class B Governor; has speeder and sawyer's lever, but no automatic safety stop.

STANDARD GOVERNORS

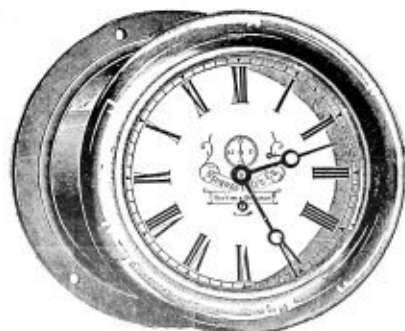
Sizes.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Class B, Plain...each	\$14.00	16.00	18.00	21.00	25.00	30.00	35.00	40.00	50.00	60.00	71.00	81.00	94.00	122.00
B, Finished "	16.00	18.00	20.00	24.00	29.00	34.00	40.00	45.00	58.00	69.00	81.00	94.00	106.00	136.00
A, Plain ... "	16.50	18.50	21.00	24.50	29.50	36.00	42.00	48.00	59.00	71.00	83.00	96.00	109.00	140.00
A, Finished "	18.50	20.50	23.00	27.50	33.50	40.00	47.00	53.00	67.00	80.00	93.00	107.00	121.00	154.00

SPRING GOVERNORS

Size of Governor, Diameter of Opening	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7
Class "B"—Plain....	\$14.00	16.00	18.00	21.00	25.00	30.00	35.00	40.00	50.00	60.00	71.00	83.00	94.00	122.00	150.00
Class "B"—Finished..	16.00	18.00	20.00	24.00	29.00	34.00	40.00	45.00	58.00	69.00	81.00	94.00	106.00	136.00	166.00
Class "A"—Plain....	18.50	21.00	24.50	29.50	36.00	42.00	48.00	59.00	71.00	83.00	96.00	109.00	140.00	170.00	200.00
Class "A"—Finished..	20.50	23.00	27.50	33.50	40.00	47.00	53.00	67.00	80.00	93.00	107.00	121.00	154.00	186.00	220.00

ENGINE ROOM CLOCKS

Made with Heavy Brass or Nickel Plated Cases; Rings are Hinged and Furnished with Lock



Size Dial, inches	Movement	PRICE EACH	
		Brass Case	Nickel Plated Case
5	Seth Thomas or Boston	\$ 35.00	\$ 36.00
6		40.00	41.50
$6\frac{3}{4}$		45.00	47.00
$8\frac{1}{2}$		55.00	57.50
10	Howard	65.00	68.00
$6\frac{3}{4}$		70.00	72.00
$8\frac{1}{2}$		80.00	82.50
10		90.00	93.00
12	"	110.00	114.00

Size.....inches	1	1½	1½	2	2½	3	3½	4	4½	5	6
Globe and Angle With Yoke.....	\$8.00	\$10.75	\$15.00	\$18.50	\$22.50	\$27.50	\$31.00	\$42.00
Without Yoke.....	7.00	9.00	12.50	.....	.....	.....	.....	.....
Horizontal Check.....	11.50	.....	18.00	.....	26.00	35.00
Vertical Check.....	1.50	.....	.....	.....	.....	45.00

H.Channon Company. Chicago.

GENUINE JENKINS BROS.' VALVES



Globe



Angle



Cross

Standard Brass Screwed Globe, Angle and Cross Valves

Size, inches	PRICE EACH	
	Globe and Angle Valves	Cross Valves
$\frac{1}{4}$	\$ 1.10	\$ 1.70
$\frac{3}{8}$	1.25	2.00
$\frac{1}{2}$	1.60	2.25
$\frac{3}{4}$	2.20	2.50
1	2.80	3.25
$1\frac{1}{4}$	4.00	4.75
$1\frac{1}{2}$	5.50	6.25
2	8.75	9.50
$2\frac{1}{2}$	15.75	20.00
3	22.00	27.50



Horizontal Check



Angle Check



Vertical Check

Standard Brass Screwed Horizontal, Angle and Vertical Check Valves

Size, inches	Price Each	Size, inches	Price Each
$\frac{1}{4}$	\$1.10	$1\frac{1}{4}$	\$ 3.00
$\frac{3}{8}$	1.20	$1\frac{1}{2}$	5.00
$\frac{1}{2}$	1.30	2	7.50
$\frac{3}{4}$	1.90	$2\frac{1}{4}$	13.50
1	2.60	3	21.00

Extra Heavy Brass Globe, Angle and Check Valves

Size, inches	GLOBE AND ANGLE		CHECK	
	Screwed	Flanged	Screwed	Flanged
$\frac{1}{2}$	\$ 4.00	\$ 6.00	\$ 3.00	\$ 5.00
$\frac{3}{4}$	5.00	7.50	3.50	6.50
1	6.50	10.00	4.50	8.50
$1\frac{1}{4}$	8.25	13.00	6.00	11.00
$1\frac{1}{2}$	11.00	17.00	7.50	14.00
2	16.00	24.00	11.50	20.00
$2\frac{1}{2}$	33.00	43.00	24.00	34.00
3	45.00	57.00	34.00	46.00

GENUINE JENKINS BROS. VALVES



Globe Valve—With Yoke



Horizontal Check Valve



Globe Valve—Without Yoke

STANDARD IRON BODY COMPOSITION MOUNTED GLOBE AND ANGLE VALVES

Without Yoke

SCREWED		FLANGED	
Size	Price Each	Size	Price Each
1/2	\$2.80	1/2	\$3.80
3/4	2.80	3/4	3.80
1	3.00	1	4.40
1 1/4	4.00	1 1/4	5.40
1 1/2	5.00	1 1/2	6.00
2	7.25	2	8.50

With Yoke

SCREWED		FLANGED	
Size	Price Each	Size	Price Each
2	\$10.00	2	\$11.75
2 1/2	12.00	2 1/2	14.00
3	16.75	3	18.50
4	24.00	4	26.00
5	40.00	5	42.00
6	48.00	6	50.00

STANDARD IRON BODY COMPOSITION MOUNTED HORIZONTAL, ANGLE AND VERTICAL CHECK VALVES

Size	Screwed	Flanged	Size	Screwed	Flanged
2	\$ 8.00	\$10.00	4	\$20.00	\$23.00
2 1/2	11.00	13.00	5	30.00	33.00
3	14.00	16.50	6	40.00	43.00



STANDARD BRASS "Y" BLOW-OFF VALVES

With Renewable Seat Rings

Size	Screwed	Size	Flanged
1/2	\$ 2.00	1	\$ 9.00
3/4	2.00	1 1/4	11.00
1	3.00	1 1/2	13.00
1 1/4	4.00	2	20.00
1 1/2	5.00	2 1/2	28.00
2	6.50	3	37.00
2 1/2	9.25	...	...
3	18.00	...	...
...	25.00	...	...

DISCS FOR JENKINS VALVES

Size	Price Each	Size	Price Each	Size	Price Each	Size	Price Each
1/2	\$0.03	2	\$0.18	5	\$0.68	14	\$3.00
3/4	.04	2 1/2	.24	6	.90	16	4.00
1	.04	3	.33	7	.98	18	5.00
1 1/4	.05	3 1/2	.45	8	1.20	20	6.00
1 1/2	.05	4	.52	9	1.60	24	9.00
2	.08	4 1/2	.60	10	1.75	...	...
2 1/2	.12	...	...	12	2.25	...	...



POWELL'S REGRINDING VALVES



Globe



Horizontal Check



Angle

"Model Star" Screwed Globe, Angle, Cross and Check Valves

Standard—For working pressures up to 200 pounds.

Size, inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Globe or angle.....	\$0.70	\$0.85	\$1.15	\$1.45	\$2.00	\$2.80	\$3.90	\$6.20	\$12.00	\$16.50	\$30.00
Cross.....	1.00	1.00	1.50	2.00	2.70	3.50	5.10	8.00	16.00	24.00	50.00
Check—angle or horizontal...	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00	30.75

Extra Heavy—For working pressures up to 300 pounds.

Size, inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Globe or angle.....	\$0.95	\$1.15	\$1.55	\$2.40	\$3.75	\$5.35	\$7.45	\$11.40	\$20.40	\$30.35	\$56.35
Cross.....	1.25	1.35	2.00	3.00	4.75	6.60	9.00	13.75	24.50	36.00	66.50
Check—angle or horizontal...	.75	.75	1.05	1.80	2.95	4.10	5.75	9.30	17.00	25.50	47.50



"Ready"

LEVER THROTTLE VALVES

Cuts show valves with handles on right hand side. They can be furnished with handles on opposite side if desired.



"Titan"

"Ready"—For working pressures up to 75 pounds.

Size, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price each.....	\$1.60	\$1.80	\$2.50	\$3.50	\$5.00	\$7.50	\$13.50	\$19.00

"Titan"—For working pressures up to 175 pounds.

Size, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price each.....	\$2.50	\$3.00	\$4.00	\$5.00	\$7.00	\$10.00	\$19.00	\$29.00

STANDARD STRAIGHTWAY OR GATE VALVES

BRASS SCREWED, RISING STEM

Brass Taper Seats, Double Gate—125 lbs. Pressure

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....each	\$1.25	1.25	1.30	1.75	2.50	3.50	5.00

STANDARD, IRON BODY, BRASS MOUNTED

Screwed or Flanged, Wedge Gate, Non-Rising Stem; Working Pressure 125 lbs. on the 16 inch and Smaller; 18 inches and up, 100 lbs.

Size.....inches	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Price.....each	\$9.00	10.00	12.00	15.00	18.00	20.00	25.00	30.00	36.00
E. to E., Screwed, in.	5	5 7/8	5 3/4	6 1/2	6 3/4	6 7/8	7 1/4	7 3/8	7 3/4
F. to F., Flanged, in.	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	10 1/2
Diam. Flanges...in.	5	6	7	7 1/2	8 1/2	9	9 1/4	10	11

Screwed or Flanged take same list.

STANDARD BUTTERFLY VALVES BRASS

For Steam Working Pressures up to 125 lbs. These Valves are not intended to be Steam Tight

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....each	\$3.10	4.40	5.65	6.75	10.00	13.75	21.00

IRON BODY BRASS TRIMMINGS

For Steam Working Pressures up to 125 lbs. Not intended to be Steam Tight

Size.....inches	2	2 1/2	3	3 1/2	4	5	6
Screwed.....	\$8.00	9.50	12.00	16.00	18.50	28.50	42.50
Flanged.....	9.50	11.50	15.00	19.00	22.00	32.00	47.00
E. to E., Screwed.....inches	4 1/4	4 3/4	5 1/4	5 1/2	6	6 3/4	7 1/2
F. to F., Flanged.....inches	4 3/4	4 3/4	5 1/4	5 1/2	6	6 3/4	7 1/2
Diameter Flanges.....inches	6	7	7	8 1/2	9	10	11

STANDARD SAFETY VALVES

For Working Pressures
up to 100 lbs.

BRASS—ANGLE OR CROSS

Size.....inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....each	\$2.20	2.50	3.25	3.90	4.70	7.15	9.00	12.50	22.50	33.50

CROSS ONLY—IRON BODY—BRASS TRIMMINGS—SCREWED

Size.....inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Price.....each	\$5.00	5.80	7.80	13.25	17.25	23.00	28.75	34.50	41.50	57.75	93.50	132.00

CROSS ONLY—IRON BODY—BRASS TRIMMINGS—FLANGED

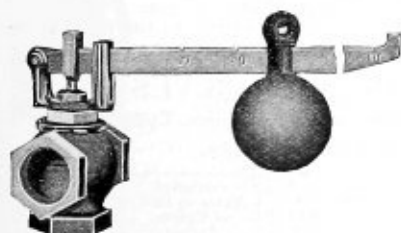
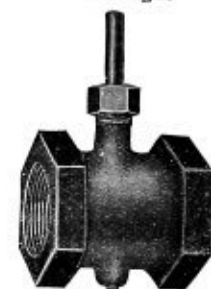
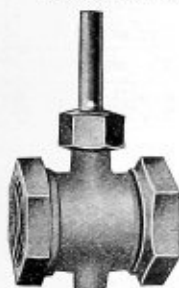
Size.....inches	4	5	6	Size.....inches	4	5	6
Price.....each	\$34.00	48.00	65.00	Face to Face.....inches	11	13	14
Diam. Flanges...in	9	10	11	Center to Inlet...in.	5 1/2	6 1/2	7



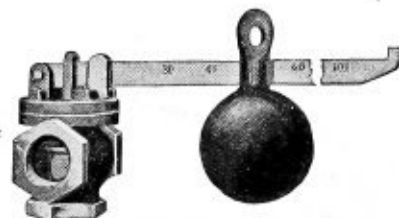
Brass
Rising Stem



I. B. M. Wedge Gate
Non-Rising Stem



Brass



Iron Body—Brass Trimmings

BRASS, WATER AND CYLINDER RELIEF VALVES

For Pumps, Steam Engine Cylinders, Pipe Lines, Tanks, Hydraulic Presses and Elevators



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12



Fig. 13

When ordering always specify the style number and state the pressure at which valves are wanted set to relieve.

Fig. 8 is intended for use as Water or Cylinder Relief Valves and will be set at any pressure specified up to 250 pounds.

Fig. 9 same as Fig. 8 but fitted with lock-up attachment. Where boiler inspector seal is required, we furnish these valves with suitable holes drilled for attaching wire and seal, in place of the lock and pin.

Fig. 10 will be set at any pressure specified up to 500 lbs. This style valve in all sizes is furnished with female base. When otherwise required, or flanged, will be made to order at a special price.

Fig. 11 Hydraulic Valve will be set at any pressure specified up to 5,000 lbs. (according to size) and furnished as shown in cut, unless otherwise specified. Prices of these Valves on application.

Fig. 12 and Fig. 13 Cylinder Relief or Snifting Valves will be set at any pressure specified up to 250 lbs.

Size, inches		1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4
Fig. 8	Price, Finished, Each	\$10.00	\$10.00	\$12.50	\$15.50	\$19.00	\$28.00	\$40.00	\$52.00	\$ 90.00	\$125.00	\$150.00
	" Nickel-Pltd. "	11.50	11.50	14.50	18.00	22.00	32.00	45.00	58.00	100.00	135.00	165.00
Fig. 9	" Finished, " "	15.00	15.00	18.50	21.50	26.00	35.00	48.00	60.00	100.00	135.00	165.00
	" Nickel-Pltd. "	17.00	17.00	21.00	24.50	30.00	40.00	54.00	67.00	100.00	135.00	165.00
Fig. 10	" Finished, " "	25.00	25.00	30.00	35.00	40.00	55.00	80.00	100.00	100.00	100.00	100.00
	" Nickel-Pltd. "	26.50	26.50	32.00	37.50	43.00	59.00	85.00	106.00	106.00	106.00	106.00
Fig. 12	" Finished, " "	8.50	8.50	10.50	13.00	16.00	24.00	35.00	45.00	45.00	45.00	45.00
	" Nickel-Pltd. "	9.50	9.50	12.00	15.00	18.50	27.00	38.50	50.00	50.00	50.00	50.00
Fig. 13	" Finished, " "	10.00	10.00	12.50	15.50	19.00	28.00	40.00	52.00	90.00	125.00	150.00
	" Nickel-Pltd. "	11.50	11.50	14.50	18.00	22.00	32.00	45.00	58.00	100.00	135.00	165.00

Figs. 8, 12 and 13 will be furnished with male base up to and including 2 1/2 inch, and with female base sizes 3 to 4 inch, inclusive. When required otherwise or flanged, they will be furnished at a special price.

The 2 1/2-inch Valve is made for regular 2 1/2-inch connections.

For wrench adjustment, brass valves will be made with removable cap as shown in cuts.

To adjust for different pressures, loosen lock-nut, turn hand-wheel or pressure screw to the right to increase pressure, to the left to decrease pressure, then tighten lock-nut.

IMPROVED WATER RELIEF VALVES

Iron Body. Brass Seat. For Pumps, Stand-Pipes, Pipe Lines, Cylinders, etc.

Set at Any Pressure Specified Up to 250 lbs.



Fig. 14

Can Furnish Also
with Square
Stem Nut for
Wrench Adjust-
ment

Size, Inches	Price, with Brass Seat, Each	Diameter of Base Flange, Inches	Center of Out- let to Bottom of Base Flange, Inches	Diameter of Outlet Flange, Inches	Center of Valve to End of Outlet, Inches	Total Height, Inches
2 1/2	\$ 45.00	7 1/2	5 1/4	5 1/4	3 7/8	17 1/8
3	60.00	8 1/4	5 3/4	5 3/4	4 1/8	18 1/8
3 1/2	75.00	9	6 1/4	6 1/4	4 5/8	20 1/8
4	90.00	10	6 3/4	6 3/4	5	21
4 1/2	110.00	10 1/2	7 1/8	7 1/8	6	22 1/2
5	125.00	11	7 3/8	7 3/8	7 1/8	23 1/8
6	175.00	12 1/2	8 1/2	8 1/2	8 1/8	25 1/8

These Valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

Base or outlet flanges, on special orders, will be made to suit any diameter or thickness required, at an additional price. Drilling will be extra at regular Extra-heavy drilling list prices and discount.

BRASS POP SAFETY VALVES



Fig. 1



Fig. 2



Fig. 3

Figure 1.—Low pressure pattern; set at any pressure up to 20 lbs. Have best steel springs. Made plain, finished or nickel plated. Plain body set at 10 lbs. sent unless otherwise specified.

Figure 2.—Ordinary pattern; set at any pressure up to 125 lbs. Always state at what pressure valves should be set.

Figure 3.—Muffler pattern; set at any pressure up to 250 lbs. Muffles noise of discharging steam. Always state at what pressure valves should be set.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. 1 with plain body.....		\$7.00	\$ 8.00	\$ 9.00	\$11.00	\$15.00	\$35.00
Fig. 1 " finished ".....		8.00	9.00	10.25	12.50	17.00	38.00
Fig. 1, " and nickel plated....		9.00	10.00	11.50	14.00	19.00	40.00
Fig. 2, ordinary brass finish.....		\$8.50	8.50	10.50	13.00	16.00	24.00	.....
Fig. 3, ".....		21.00	26.00	32.00	48.00	.....
Fig. 3 with lock-up attachment.....		26.00	32.00	39.00	55.00	.....

**Self-Adjusting "Pop" Regular—For Small Stationary and Marine Boilers
Set at Any Pressure Specified up to 250 Lbs.**

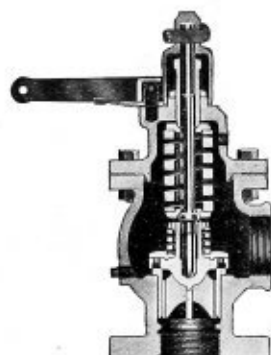
Fig. 4
Side OutletFig. 4
Side OutletFig. 5
Side Outlet
With Lock-upFig. 6
Top OutletFig. 6
Top OutletFig. 7
Top Outlet
With Lock-up

Be sure to specify style number and the pressure to blow off at.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Fig. 4, Side outlet..... each		\$10.00	\$10.00	\$12.50	\$15.50	\$19.00	\$28.00	\$40.00	\$52.00
Fig. 5, Lock-up..... " "		15.00	15.00	18.50	21.50	26.00	35.00	48.00	60.00
Fig. 6, Top outlet..... " "		8.50	8.50	10.50	13.00	16.00	24.00	35.00	45.00
Fig. 7, Lock-up..... " "		13.50	13.50	16.50	19.00	23.00	31.00	43.00	53.00
For Boilers..... H. P.		6	6	10	20	30	40	55	70
Marine Boilers, grate surface, sq. ft.		\$1.32	1.32	2.35	3.68	5.30	9.42	11.93	14.72

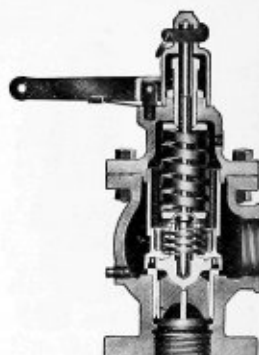
$2\frac{1}{4}$ -inch valve has $2\frac{1}{2}$ -inch connection. Can be made with female base or flanged connection at an extra price. Fig. 5 or Fig. 7 can be drilled for inspector's seal instead of pin and lock.

STANDARD IRON BODY, BRASS SEAT SAFETY VALVES



Plain Spring Type

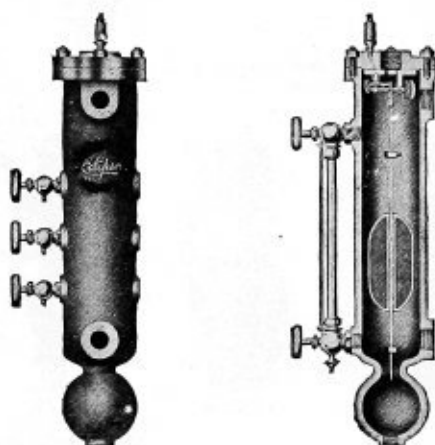
These valves have best steel springs and self-adjusting spring discs. They are made with bevel seats at an angle of 45 degrees. Set at any pressure specified up to 250 pounds. They are easily taken apart for cleaning, inspection or repairs without disturbing outlet pipe or removing valve. Each valve is correctly set and thoroughly tested. Always state size of valve wanted and pressure at which it is to be set. Plain spring type always furnished unless otherwise ordered. These valves are regularly made with combination flanged and screwed base. Where boiler inspector's seal is required, valves are furnished with extra hole in stem pin, if so specified, at same price.



Encased Spring Type

Size, inches	2½	3	3½	4	4½	5	6
Plain Spring Type, Each.....	\$45.00	\$60.00	\$ 75.00	\$ 90.00	\$110.00	\$125.00	\$175.00
Encased Spring Type, Each...	65.00	85.00	105.00	125.00	150.00	170.00	235.00
Total Height, inches.....	16¼	17¾	20½	21¼	22½	23¼	25½
For Boilers, Nominal H. P.....	70	100	125	150	175	200	300

ECLIPSE SAFETY WATER COLUMN



For both high and low water alarm. They have few intricate parts and are absolutely reliable. Made with any variation between alarms, and adapted for either right or left hand.

All parts are attached to top flange and can be easily removed.

No. 1. Medium, glass 12 in., with trimmings...\$30.00

No. 2. Large, glass 15 in., with trimmings.... 35.00

In ordering always state boiler pressure carried.

IMPROVED STEAM CONDENSING EXHAUST PIPE HEADS

Escape Dry and Noiseless. No Back Pressure



These exhaust heads completely stop the emission of grease and water from the pipe, and save roofs and walls from deterioration.

Made of galvanized steel, in all sizes from 1 inch to 48 inch diameter of pipe opening.

Pipe Size, inches	Price Each	Pipe Size, inches	Price Each
1 or 1½	\$ 20.00	10	\$125.00
2 or 2½	25.00	11 or 12	150.00
3 or 3½	30.00	13	175.00
4 or 4½	40.00	14	200.00
5	50.00	15	235.00
6	60.00	16	250.00
7	75.00	17	270.00
8	90.00	18	300.00
9	105.00	.....	.....

PRESSURE REGULATORS



No. 1



No. 2



No. 3

No. 1. Recommended for use where the initial pressure is comparatively constant and is not subject to a pulsation or rapid variation.
No. 2. Is the same in construction as No. 1, but has the addition of an oil cylinder or dash pot, which will prevent the inner valve from jumping or chattering when the initial pressure changes rapidly.
No. 3. Has an expanded outlet which allows the steam to expand quickly and reduce in velocity after it has passed through the valve. It is particularly adapted for low pressure work.

No. 1 REGULATOR

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	10	12
Price.....each	\$22	\$24	\$26	\$28	\$30	\$36	\$42	\$48	\$60	\$72	\$90	\$120	\$160	\$200	\$300	\$435

No. 2 REGULATOR

Size.....inches	1 1/2x3	2x4	2 1/2x5	3x6	4x8	5x10	6x12	8x14
Price.....each	\$48	\$60	\$80	\$100	\$160	\$235	\$335	\$430

No. 3 REGULATOR

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	10	12
Price.....each	\$26	\$28	\$32	\$35	\$40	\$50	\$60	\$70	\$80	\$105	\$140	\$190	\$230	\$290	\$360

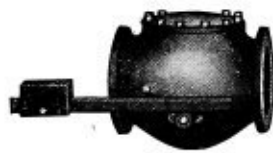
BACK PRESSURE VALVES

STANDARD SCREWED IRON BODY

Brass Mounted. Weighted for back pressures
 up to 5 lbs. Horizontal pattern furnished
 in sizes 4 inches and larger only



Vertical



Horizontal

Size.....inches	2	2 1/2	3	3 1/2	4	5	6
Price.....each	\$11.00	\$13.00	\$15.00	\$19.00	\$22.50	\$33.50	\$43.00

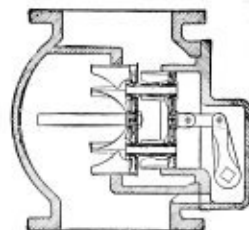
PATENTED NOISELESS BACK PRES-
 SURE VALVES
 FOR NON-CONDENSING ENGINES

Is designed for use in connection with Non-Condensing Engines to hold a back pressure where the exhaust steam is used for heating purposes. It is durable, sensitive, noiseless in operation and does not stick.

The area of valve is equal to the area of pipe, and will operate in either a horizontal or vertical position by changing the position of lever and weight.



"Noiseless"



Cross Section View

Size.....inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Price.....each	\$14	\$16	\$18	\$22	\$25	\$30	\$40	\$60	\$80	\$100
L'gth, fc. to fc., screw'd v'lves...	7 1/2	8 1/2	9	9 1/2	10 1/2	11 1/2	12	13	14	15 1/2
L'gth, fc. to fc., flanged v'lves...	.....	.....	9 1/2	10 1/2	11 1/2	12	13	14	15 1/2	16 1/2

In ordering please state if Valve is to be used in vacuum system of heating. Sizes 3 to 6 made screwed and flanged ends. Sizes 7 and upwards have flanged ends only.

STEAM TRAPS

"NASON," OR STANDARD STEAM TRAPS



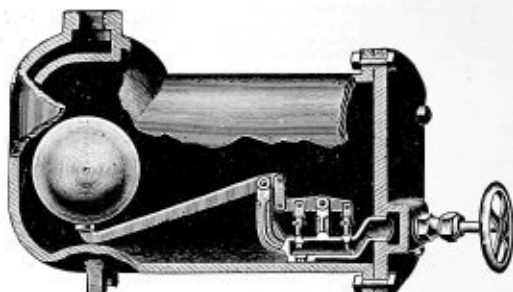
No.	Pipe Connections, inches	No. of Lineal Feet of 1-inch Pipe	Height, inches	Weight, lbs.	Price Each
1	1/2	1,050	11	40	\$16.00
2	3/4	2,700	14	80	20.00
3	1	4,200	15	113	27.50
4	1 1/4	6,000	18 1/2	176	42.50
5	1 1/2	10,500	22	336	70.00

Always Specify For What Pressure Required When Ordering

DAVIS STEAM TRAP

These traps have a double seated balanced valve, and will work as well under high as under low pressure. The discharge is sealed at all times; all working parts are attached to the cover, and may be removed without disconnecting the trap. In ordering please state at what pressure trap is to work.

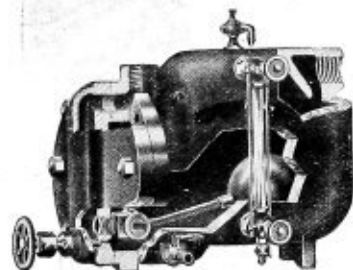
No.	Pipe Connections, inches	No. of Lineal Feet of 1-inch Pipe	Weight, lbs.	Price Each
00	1/2	1,500	25	\$15.00
0	3/4	3,000	40	20.00
1	1	6,500	60	30.00
2	1 1/4	15,000	80	45.00
3	1 1/2	20,000	125	60.00
4	2	30,000	235	80.00
5	2 1/2	40,000	240	100.00
6	3	60,000	250	125.00



"PETERS" CORLISS VALVE STEAM TRAP

Simplicity, durability, capacity and emergency are the essential features. Valve is self-cleaning, never pounds, and is always water sealed.

Water gauge, air and sediment cocks and bypass valve supplied with each trap. All traps thoroughly tested under working pressure. All parts are interchangeable.

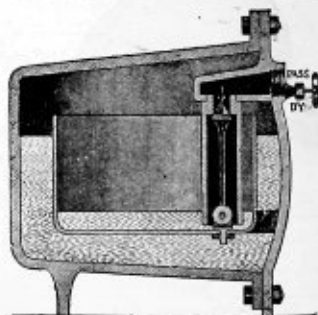


Size	Price	Pipe Conn. inches	Capacity Lineal ft. 1 inch Pipe	Capacity Sq. Ft. Htg. Surface	Capacity lbs. Water 1 hrs. Discharge
1	\$20.50	1/2	3,000	1,000	900
2	22.50	3/4	4,000	1,350	1,500
3	28.50	1	6,000	2,000	2,400
4	35.00	1 1/4	14,000	4,500	3,500
5	50.00	1 1/2	18,000	6,000	5,000
6	70.00	2	27,000	9,000	7,500
7	90.00	2 1/2	40,000	13,000	15,000

KIELEY STANDARD STEAM TRAPS

Size Nos.	Price Each	Size Inlet and Outlet Connections	Capacity Lineal Feet 1-inch Pipe	Capacity Square Feet Radiation	Capacity lbs. Water per Hour
1	\$25.00	1/2	4,000	1,300	500
2	35.00	1	6,000	2,000	725
3	45.00	1 1/4	10,000	3,300	1,200
4	60.00	1 1/2	15,000	5,000	2,000
5	80.00	2	25,000	8,300	3,000
6	100.00	2 1/2	35,000	11,500	4,000
7	125.00	3	50,000	16,500	6,000

Always Specify for What Pressure Required When Ordering

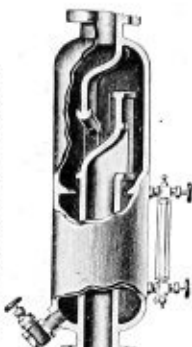


THE "PITTSBURGH" SEPARATOR

For Live and Exhaust Steam and Oil,
Without Baffle Plates

Horizontal

In both horizontal and vertical types the steam, entering at full velocity, is forced to make a sudden reversal of direction of flow, with immediate reduction of velocity. The separator body having a sectional area at least four times the area of the inlet and outlet connections, the velocity of the steam is reduced in like ratio. Even without reduction of velocity, the sudden reversal of flow would, by its whip-snap action, allow gravity to affect separation of entrainment. But with full velocity of steam through separator, there would be liability of picking up some separated liquids and carrying them on with the outgoing current. This is prevented by reduced velocity and by the protected character of receiver well. The full velocity of entering steam is useful in casting the entrainment directly to receiver space; then the steam, reversing its direction, rises at greatly reduced velocity, and without the slightest tendency toward carrying any liquids with it to the outlet.



Vertical

Size, inches	No. of Holes	Size of Holes, inches	Size of Bolts, inches	Size of Drain, inches	Size of Gauge Cocks, inches	Price	Size, inches	No. of Holes	Size of Holes, inches	Size of Bolts, inches	Size of Drain, inches	Size of Water Gauge, inches	Price
1½	4	¾	¾ x 2¾	1½	¾	\$ 30.00	1½	4	¾	¾ x 2¾	1½	¾	\$ 30.00
2	4	¾	¾ x 3	1½	¾	40.00	2	4	¾	¾ x 3	1½	¾	40.00
2½	4	¾	¾ x 3¼	1½	¾	45.00	2½	4	¾	¾ x 3¼	1½	¾	45.00
3	8	¾	¾ x 3½	1½	¾	50.00	3	8	¾	¾ x 3½	1½	¾	50.00
3½	8	¾	¾ x 3¾	1½	¾	60.00	3½	8	¾	¾ x 3¾	1½	¾	60.00
4	8	¾	¾ x 4	1½	¾	70.00	4	8	¾	¾ x 4	1½	¾	70.00
4½	8	¾	¾ x 4¼	1½	¾	75.00	4½	8	¾	¾ x 4¼	1½	¾	75.00
5	8	¾	¾ x 4½	1½	¾	80.00	5	8	¾	¾ x 4½	1½	¾	80.00
6	12	¾	¾ x 4¾	1½	¾	110.00	6	12	¾	¾ x 4¾	1½	¾	110.00
7	12	1	1 x 4	1½	¾	125.00	7	12	1	1 x 4	1½	¾	125.00
8	12	1	1 x 4¼	1½	¾	160.00	8	12	1	1 x 4¼	1½	¾	160.00
10	16	1	1 x 4¾	2	1	220.00	10	16	1	1 x 4¾	1½	¾	220.00
12	16	1	1 x 5	2	1	250.00	12	16	1	1 x 5	1½	¾	250.00
							14	20	1	1 x 5½	2	1	300.00
							16	20	1½	1 x 5½	2½	1½	400.00

Prices include Extra Heavy Flanges with Bolts and Nuts, Water Gauges, Outlet Valve and connection. If Standard Flanges are desired please so specify.

ECLIPSE STEAM SEPARATOR

For Live Steam, Exhaust Steam and Oil

The steam entering Separator strikes the baffle plate, the condensation or oil passes to the receiver at bottom, and the dry steam passes around and does not come in contact with the separated oil or condensation.

The Separators are designed and laid out with a view of obtaining as large a baffle surface and internal area as necessary and to decrease the velocity of the steam.

When oil Separators are for use in vacuum systems it is necessary to provide special apparatus adapted to the conditions.

We must know the pounds of steam passing through the separator and vacuum carried.



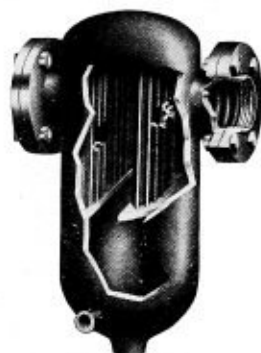
Standard Horizontal Pattern



Standard Vertical Pattern

Size, inches	Price Each	Size, inches	Price Each	Size, inches	Price Each	Size, inches	Price Each
1½	\$30.00	3½	\$60.00	5	\$ 80.00	8	\$160.00
2	40.00	4	70.00	6	110.00	10	200.00
2½	45.00	4½	75.00	7	125.00	12	250.00
3	50.00						

THE "VICTOR" STEAM AND OIL SEPARATORS



Horizontal



Vertical



Oil Separator

VICTOR HORIZONTAL SEPARATORS

Size, inches...	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price each...	\$40.00	45.00	50.00	60.00	70.00	75.00	80.00	110.00	125.00	160.00	180.00	220.00

VICTOR VERTICAL SEPARATORS

Size, inches...	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price each...	\$40.00	45.00	50.00	60.00	70.00	75.00	80.00	110.00	125.00	160.00	180.00	220.00

VICTOR OIL SEPARATORS

Size, inches...	2	2½	3	3½	4	4½	5	6	7	8	9	10
Price each...	\$75.00	90.00	110.00	120.00	125.00	155.00	160.00	180.00	300.00	300.00	400.00	400.00

All Prices include Companion Flanges and Water Gauges.

VATERS' TWO STAGE SEPARATORS

FOR REMOVING:

Moisture from a Current of Steam,
Oil from a Current of Steam under Exhaust Pressures,
Oil from a Current of Steam Flowing to a Condenser,

Moisture from Compressed Air Pipe Lines,
Moisture from Producers or Natural Gas Lines,
Solids from Gaseous Currents of Various Kinds.

In this device there are three chambers, viz.: An inlet chamber, having a baffle plate. A decreased velocity chamber, having a baffle plate. An exit chamber.

Our Two Stage Separator is one in which the work is performed as thoroughly as can be done on a single baffle plate in the entry chamber and completed in the immediate chamber under a change in conditions that admits of further work being done. This change in condition is a reduction of the speed at which the steam is traveling. The exit chamber simply conducts the outflowing steam into the pipe line.

Sectional
Perspective
View

Showing the arrangement of Baffle Plates and the Decreased Velocity Chamber.

Pipe Size, inches	Horizontal and Vertical Steam	Horizontal Oil	Vertical Oil
3	\$ 60.00	\$ 52.50	\$ 60.00
3½	70.00	62.50	70.00
4	80.00	72.50	80.00
4½	95.00	85.00	95.00
5	106.00	95.00	106.00
6	135.00	120.00	135.00
7	160.00	145.00	160.00
8	185.00	168.00	185.00
10	210.00	190.00	210.00
12	250.00	225.00	250.00

STANDARD WROUGHT PIPE FOR GAS, STEAM AND WATER



Standard

Nominal Inside Diameter, Inches	Black or Galvanized, Price per Foot	Thickness, Inches	Nominal Weight per Foot, Lbs.	Number of Threads per Inch of Screw
1/4	\$0.05 1/2	.068	0.24	27
1/2	.05 1/2	.088	0.42	18
3/4	.05 1/2	.091	0.56	18
1	.08 1/2	.109	0.84	14
1 1/4	.11 1/2	.113	1.12	14
1 1/2	.16 1/2	.134	1.67	11 1/2
2	.22 1/2	.140	2.24	11 1/2
2 1/2	.27	.145	2.68	11 1/2
3	.36	.154	3.61	11 1/2
3 1/2	.57 1/2	.204	5.74	8
4	.75 1/2	.217	7.54	8
4 1/2	.95	.226	9.00	8
5	1.30	.237	10.66	8
5 1/2	1.45	.246	12.49	8
6	1.45	.259	14.50	8
7	1.88	.280	18.76	8
8	2.35	.301	23.27	8
9	2.82	.322	28.18	8
10	3.40	.344	33.70	8
11	4.25	.366	40.00	8
12	4.75	.375	45.00	8
12	5.20	.375	49.00	8

Unless otherwise ordered, random lengths with threaded ends and couplings are furnished. On cut lengths, plain ends are furnished unless otherwise specified.

Extra Strong

Size, In.	Price per Foot	Actual Outside Diameter, Inches	Nominal Inside Diameter, Inches	Thickness, Inches	Nominal Weight per Foot, Lbs.
1/4	\$0.11	.405	.205	.100	.29
1/2	.11	.540	.294	.123	.54
3/4	.11	.675	.421	.127	.74
1	.12	.840	.542	.149	1.09
1 1/4	.15	1.05	.736	.157	1.39
1 1/2	.22	1.315	.951	.182	2.17
2	.30	1.66	1.272	.194	3.00
2 1/2	.36	1.90	1.494	.203	3.63
3	.50	2.375	1.933	.221	5.02
3 1/2	.81	2.875	2.315	.280	7.67
4	1.05	3.500	2.892	.304	10.25
4 1/2	1.33	4.000	3.358	.321	12.47
5	1.50	4.500	3.818	.341	14.97
5 1/2	1.95	5.000	4.280	.360	18.22
6	2.16	5.563	4.813	.375	20.54
7	2.90	6.625	5.750	.437	28.58
8	3.80	7.625	6.625	.500	37.67
8	4.30	8.625	7.625	.500	43.00

Unless otherwise ordered, random lengths with plain ends are furnished. On cut lengths plain ends always furnished unless otherwise specified.

Double Extra Strong

Size Inches	Price per Foot	Actual Outside Diameter	Approx. Inside Diameter	Nominal Weight per Foot
1/4	\$0.25	.84	.244	1.70
1/2	.30	1.05	.422	2.44
3/4	.37	1.315	.587	3.05
1	.52	1.46	.885	5.20
1 1/4	.65	1.90	1.088	6.40
1 1/2	.95	2.375	1.491	9.02
2	1.37	2.875	1.755	13.68
2 1/2	1.92	3.50	2.284	18.56
3	2.45	4.00	2.716	22.75
3 1/2	2.85	4.50	3.136	27.48
4	3.30	5.00	3.564	32.53
4 1/2	3.80	5.563	4.063	38.12
5	5.30	6.625	4.875	53.11
6	6.25	7.625	5.875	62.38
8	7.20	8.625	6.875	71.62

Unless otherwise ordered, random lengths with plain ends are furnished. On cut lengths plain ends always furnished unless otherwise specified.

List for Threading Pipe

Size, inches...	1/4	1/2	3/4	1	1 1/4	1 1/2
Price each....	\$0.05	\$0.05	\$0.05	\$0.05	\$0.06	\$0.07
Size, inches...	2	2 1/2	3	3 1/2	4	4 1/2
Price each....	\$0.10	\$0.15	\$0.20	\$0.25	\$0.35	\$0.45
					\$0.55	\$0.70

Standard Steel Boiler Tubes

Outside Diameter, Inches	Price per Foot	Thickness, Inches	Thickness Nearest B. W. G.	Nominal Weight per Foot, Lbs.
1 1/4	\$0.28	.095	13	1.15
1 1/2	.27	.095	13	1.40
1 3/4	.22	.095	13	1.66
2	.20	.095	13	1.91
2 1/4	.24	.095	13	2.16
2 1/2	.28	.109	12	2.75
2 3/4	.34	.109	12	3.04
3	.35	.109	12	3.33
3 1/4	.40	.120	11	3.96
3 1/2	.44	.120	11	4.28
4	.55	.134	10	5.47
4 1/2	.62	.134	10	6.17
5	.75	.148	9	7.58
6	1.00	.165	8	10.16

SPECIAL PIPE CUT TO ORDER



Diagram Showing Screwed Valve and Fittings



Diagram Showing Flanged Valve and Fittings

We are equipped with improved facilities for cutting, threading, and fitting all sizes of pipe to sketch. In laying out work of this kind great care should be taken in making sketches. All measurements should be given center to center, as shown in above diagrams. It is also necessary to know for what purpose the pipe is to be used and pressure required to stand.

SPIRAL RIVETED PIPE



Galvanized Pipe is furnished in any lengths up to 20 feet and is used for Exhaust Steam, Suction Pipe, Paper and Pulp, Compressed Air, etc.

Asphalted Pipe is furnished in any lengths up to 30 feet and is used for Discharge Pipe, Dredging, Hydraulic Mining, Pump Mains, Flow Lines, etc.

PRICES WITH PLAIN ENDS, WITHOUT CONNECTIONS

Inside Diameter, Inches	Thickness, U. S. Standard Gauge	Price per Foot		Approximate Weight per Foot	Approximate Bursting strength, in Lbs. per sq. in.	Inside Diameter, Inches	Thickness, U. S. Standard Gauge	Price per Foot		Approximate Weight per Foot	Approximate Bursting strength, in Lbs. per sq. in.
		Asphalt, Coated	Galvanized					Asphalt, Coated	Galvanized		
3	20	\$0.354	\$0.474	1.9	1500	20	14	\$ 2.92	\$ 4.06	22.1	470
	18	.392	.527	2.3	2000		12	3.82	5.37	30.6	660
4	18	.505	.680	3.0	1500	10	10	4.68	6.59	38.3	840
	16	.520	.728	3.7	1875		8	5.65	7.94	46.2	1030
5	18	.613	.826	3.7	1200	6	6	6.62	9.28	54.1	1220
	16	.631	.882	4.5	1500	22	12	4.21	5.91	33.7	595
6	16	.744	1.040	5.3	1250		10	5.15	7.26	42.2	765
	14	.867	1.207	6.6	1560	8	8	6.22	8.73	50.8	940
7	12	1.150	1.614	9.2	2170		6	7.28	10.21	59.5	1108
	16	.870	1.216	6.2	1070	24	12	4.47	6.41	36.5	540
8	14	1.012	1.410	7.7	1340		10	5.59	7.88	45.7	705
	12	1.340	1.880	10.7	1860	8	8	6.75	9.48	55.2	820
9	16	.965	1.395	7.1	935		6	7.90	11.09	64.6	1015
	14	1.161	1.620	8.8	1170	26	12	4.94	6.94	39.5	505
10	12	1.542	2.166	12.3	1640		10	6.05	8.53	49.5	650
	16	1.116	1.564	8.0	835	8	8	7.30	10.27	59.8	795
11	14	1.300	1.812	9.9	1045		6	8.56	12.01	70.0	935
	12	1.743	2.447	13.9	1460	3	3	10.38	14.54	84.9	1154
12	16	1.237	1.731	8.8	750	28	10	6.32	8.90	51.7	605
	14	1.445	2.013	11.0	935		8	7.78	10.93	63.6	735
13	12	1.914	2.688	15.3	1310	6	6	9.37	13.14	76.6	870
	16	1.354	1.897	9.7	680	30	3	11.05	15.48	90.4	1071
14	14	1.576	2.198	12.0	850		10	6.94	9.78	56.8	560
	12	2.080	2.922	16.6	1290	8	8	8.39	11.80	68.7	685
15	16	1.477	2.067	10.6	625		6	9.84	13.80	80.5	810
	14	1.719	2.395	13.0	780	3	3	11.94	16.72	97.7	1000
16	12	2.270	3.188	18.2	1080	32	10	7.53	10.60	61.6	525
	16	1.60	2.25	11.4	575		8	9.10	12.76	74.3	645
17	14	1.86	2.59	14.1	720	6	6	10.65	14.93	87.1	760
	12	2.46	3.45	19.7	1010	3	3	12.94	18.11	105.8	940
18	14	2.00	2.91	15.9	670	34	10	8.00	11.25	65.4	490
	12	2.77	3.89	22.2	940		8	9.63	13.53	78.8	600
19	10	3.38	4.75	27.6	1210	6	6	11.45	16.06	93.6	715
	14	2.17	3.12	17.0	625	30	3	13.74	19.23	112.3	880
20	12	2.97	4.16	23.7	875		10	8.45	11.90	69.1	470
	10	3.62	5.10	29.6	1125	8	8	10.20	14.33	83.4	570
21	14	2.36	3.33	18.1	585		6	11.96	16.77	97.8	680
	12	3.15	4.43	25.2	820	3	3	14.53	20.34	118.8	830
22	10	3.85	5.42	31.5	1050		10	9.37	13.20	76.7	420
	14	2.63	3.66	19.9	520	8	8	11.29	15.87	92.4	515
	12	3.40	4.84	27.6	730	6	6	13.27	18.60	108.5	610
	10	4.22	5.95	34.5	940		3	16.10	22.56	131.8	750

Working pressure should not be more than 25% of the ultimate strength or bursting pressure.

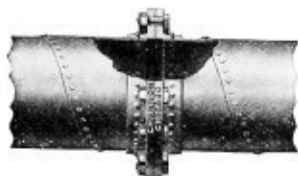
First gauge of thickness denotes Standard Pipe; second gauge, Extra Heavy Pipe, and third gauge is Double Extra Heavy Pipe.

Any gauge or diameter quoted upon request.

FLANGES, BOLTS AND GASKETS

For Spiral Riveted Pipe

Flanges are Forged Steel with Spiral Pipe Standard Diameter and Drilling



Size Inches	Outside Diameter, Inches	Thickness of Flange, Inches	FLANGES—Price, each, with Bolt Holes				Dimensions of Drilling			Bolts, Per Set		Gask- ets, Each
			Black		Galvanized		N ^o of Bolts,	Size of Bolts, Inches	Diameter of Bolt Circle, Inches	Black	Galv.	
			Flange Not Attached	Flange Attached to Pipe	Flange Not Attached	Flange Attached to Pipe						
3	6	$\frac{5}{16}$	\$.90	\$ 1.75	\$ 1.10	\$ 1.90	4	$\frac{7}{16}$	4 $\frac{3}{4}$	\$.17	\$.23	\$.17
4	7	$\frac{5}{16}$	1.05	2.05	1.30	2.30	8	$\frac{7}{16}$	5 $\frac{1}{8}$	.35	.45	.20
5	8	$\frac{5}{16}$	1.35	2.40	1.60	2.70	8	$\frac{7}{16}$	6 $\frac{1}{8}$	.35	.45	.25
6	9	$\frac{3}{8}$	1.60	2.75	2.00	3.15	8	$\frac{1}{2}$	7 $\frac{7}{8}$	.45	.60	.30
7	10	$\frac{3}{8}$	1.70	2.95	2.15	3.40	8	$\frac{1}{2}$	9	.45	.60	.35
8	11	$\frac{3}{8}$	2.15	3.45	2.80	4.05	8	$\frac{1}{2}$	10	.45	.60	.45
9	13	$\frac{3}{8}$	2.65	4.10	3.50	4.90	8	$\frac{1}{2}$	11 $\frac{1}{4}$	.45	.60	.60
10	14	$\frac{3}{8}$	2.95	4.50	3.95	5.45	8	$\frac{1}{2}$	12 $\frac{1}{4}$	.45	.60	.80
11	15	$\frac{7}{16}$	3.10	4.65	4.15	5.65	12	$\frac{1}{2}$	13 $\frac{3}{8}$	.65	.90	.90
12	16	$\frac{7}{16}$	3.25	4.75	4.35	5.85	12	$\frac{1}{2}$	14 $\frac{1}{4}$	.65	.90	1.00
13	17	$\frac{7}{16}$	3.60	5.15	4.85	6.25	12	$\frac{1}{2}$	15 $\frac{1}{4}$	.65	.90	1.10
14	18	$\frac{7}{16}$	3.80	5.50	5.10	6.80	12	$\frac{1}{2}$	16 $\frac{1}{4}$	.65	.90	1.20
15	19	$\frac{7}{16}$	4.75	7.75	6.35	9.35	12	$\frac{1}{2}$	17 $\frac{1}{4}$	.70	.95	1.45
16	21 $\frac{1}{4}$	$\frac{5}{8}$	6.50	8.60	9.00	11.00	12	$\frac{1}{2}$	19 $\frac{1}{4}$	.70	.95	1.70
18	23 $\frac{1}{4}$	$\frac{5}{8}$	7.90	10.30	11.00	13.35	16	$\frac{5}{8}$	21 $\frac{1}{4}$	1.30	1.95	2.10
20	25 $\frac{1}{4}$	$\frac{5}{8}$	9.30	12.50	12.75	15.85	16	$\frac{5}{8}$	23 $\frac{3}{8}$	1.30	1.95	2.40
22	28 $\frac{3}{4}$	$\frac{1}{2}$	11.60	15.95	15.90	20.25	16	$\frac{3}{4}$	26	1.30	1.95	3.35
24	30	$\frac{1}{2}$	13.00	18.00	17.70	22.70	16	$\frac{3}{4}$	27 $\frac{3}{4}$	1.30	1.95	3.80

We furnish threaded companion flanges to match the above standard.

FLANGED FITTINGS FOR SPIRAL RIVETED PIPE

Cast Iron—Faced and Drilled with Spiral Pipe Standard

Size, Inches	90° Elbows		45° Elbows		Tees		Reducing Tees		Crosses		Y Branches	
	Black	Galvanized	Black	Galvanized	Black	Galvanized	Black	Galvanized	Black	Galvanized	Black	Galvanized
3	\$ 2.25	\$ 2.80	\$ 1.95	\$ 2.35	\$ 3.60	\$ 4.40	\$ 4.00	\$ 4.75	\$ 4.80	\$ 5.85	\$	\$
4	3.30	4.00	3.00	3.70	5.30	6.40	5.80	7.00	8.00	9.70	8.00	9.90
5	4.60	5.50	4.00	4.90	6.60	8.00	7.30	8.80	9.90	12.00	10.30	12.60
6	4.80	6.40	4.20	5.50	7.00	9.20	7.70	9.80	10.20	13.50	12.50	16.50
7	6.10	8.00	4.50	6.00	8.50	11.20	9.40	12.00	14.00	19.00	14.00	18.70
8	9.30	12.30	7.00	9.50	13.50	18.00	14.80	19.00	24.00	31.00	20.00	27.00
9	12.90	17.00	10.50	14.00	17.00	22.50	18.70	24.00	30.00	40.00	29.00	37.50
10	14.60	19.20	11.00	15.00	20.00	26.00	22.00	28.00	38.00	50.00	38.00	50.00
11	17.90	22.40	15.00	19.50	26.00	34.00	28.00	37.00	46.00	61.00	46.00	61.00
12	20.20	26.60	17.00	22.00	31.00	41.00	34.00	44.00	55.00	72.00	54.00	71.00
14	30.90	41.70	18.00	24.00	46.00	61.00	50.00	66.00	64.00	86.00	74.00	100.00
15	39.50	53.00	22.00	30.00	56.00	76.00	62.00	82.00	80.00	108.00	86.00	116.00
16	56.60	76.00	36.00	49.00	84.00	113.50	93.00	122.00	102.00	138.00	125.00	168.00
18	67.40	91.00	52.00	70.00	110.00	148.00	121.00	159.00	129.00	174.00	142.00	191.00
20	89.20	120.00	62.00	84.00	116.00	157.00	128.00	168.00	146.00	197.00	154.00	208.00
22	105.00	142.00	74.00	100.00	153.00	206.00	168.00	222.00	193.00	260.00	197.00	266.00
24	132.00	178.00	91.00	122.00	187.00	253.00	206.00	272.00	240.00	325.00	249.00	336.00

CAST IRON WATER PIPE

Made in 12-Foot Lengths



Conditions under which Water Pipe is used vary and we are in position to furnish Cast Iron Pipe to meet any requirements. The question of the proper weight to use for the duty required should be given very careful consideration in ordering. All water pipe is coated with tar and tested to a hydrostatic pressure of 300 pounds per square inch.

TABLE OF WEIGHTS AND THICKNESSES USED UNDER DIFFERENT PRESSURES

Size.....inches	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	60	72
Thickness, Standard.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Weight per foot for 100 pound pressure per square inch.....lbs.	18	22	34	47	64	82	121	133	160	190	260	360	488	625	830	1230	1834
Thickness, Medium.....inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Weight per foot for 150 pound pressure per square inch.....lbs.	19	24	38	55	73	90	135	150	190	225	300	425	600	800	1000	1500	2217
Thickness, Heavy.....inches	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Weight per foot for 200 pound pressure per square inch.....lbs.	21	26	40	60	80	110	150	175	215	250	350	500	750	1000	1250	1800	2520

CAST IRON FLANGED PIPE

Made in 12-Foot Lengths. Suitable for a Working Water Pressure of 100 Pounds

UNIVERSAL TEMPLATE



DIMENSIONS OF CAST IRON FLANGED PIPE

Inside Diameter of Pipe.....inches	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
Thickness of Pipe.....inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Weight of Pipe, per foot.....lbs.	18	24	35	50	70	90	115	140	160	200	275	375	495	630	800
Outside Diameter of Flange.....inches	7 $\frac{1}{4}$	9	11	13 $\frac{1}{2}$	16	19	21	23 $\frac{1}{2}$	25	27 $\frac{1}{2}$	32	38 $\frac{1}{2}$	45 $\frac{1}{2}$	52 $\frac{1}{2}$	59 $\frac{1}{2}$
Width of Flange Face.....inches	2 $\frac{3}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$
Thickness of Flange.....inches	$\frac{3}{4}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Diameter of Bolt Circle.....inches	6	7 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{1}{2}$	14 $\frac{1}{2}$	17	18 $\frac{1}{2}$	21 $\frac{1}{2}$	23 $\frac{1}{2}$	25	29 $\frac{1}{2}$	36	42 $\frac{1}{2}$	49 $\frac{1}{2}$	56
Number of Bolts in Flange.....	4	4	8	8	12	12	12	16	16	20	20	28	32	36	44
Size of Bolts.....inches	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$
Length of Bolts.....inches	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{4}$	7 $\frac{3}{4}$
Weight of Bolts, per joint.....lbs.	2	3	6 $\frac{1}{2}$	6 $\frac{1}{2}$	15 $\frac{1}{2}$	16	24 $\frac{1}{2}$	34 $\frac{1}{2}$	45	58	77	132	156 $\frac{1}{2}$	245	312

Shorter lengths than 12-foot furnished to order. Special weights for any pressure furnished to order. Steam Pipe should be heavier than above dimensions. Bolts and Gaskets furnished only to order. Drilling is $\frac{1}{8}$ -inch larger than the Bolts. In ordering, specify if flanges are to be drilled. If other than standard drilling is wanted, send template. In laying out Flanged Pipe, use 12-foot joints if possible. 4 to 24-inch Standard Pipe usually carried in stock in 12-foot lengths, faced $\frac{1}{16}$ inch short to allow for Gaskets.

CAST IRON FITTINGS

Cast iron fittings, both flanged and with belt and spigot ends quoted on application. We furnish all sizes and reductions from 2 to 48 inch, all with full waterway and easy bends.

CAST IRON GAS PIPE

Size.....inches	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
Thickness.....inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$	$\frac{1}{1}$
Weight, per foot.....pounds	17	20	30	41	56	74	105	112	133	159	205	275	368	450	600

In ordering Gas Pipe always specify if Pipe is to be coated or uncoated.

Tested to a hydrostatic pressure of 200 pounds per square inch.

TABLE OF LEAD AND JUTE REQUIRED TO CALK THE JOINTS OF CAST IRON PIPE

Size.....inches	3	4	6	10	12	14	16	18	20	24	30	36	42	48	60	72
Lead, per joint.....pounds	4 $\frac{1}{2}$	5 $\frac{1}{2}$	8	11 $\frac{1}{2}$	14 $\frac{1}{2}$	18	21 $\frac{1}{2}$	24	27	31	37	51	75	90	110	230
Jute, per joint.....ounces	8	9	12	15	17	24	26	29	32	32	37	50	60	80	120	155

Lead and Calking Jute fully listed elsewhere in this catalog (see index).

STANDARD CAST IRON AND MALLEABLE IRON FITTINGS

Elbows
C. I.Elbows
M. I.45° Elbows
C. I.45° Elbows
M. I.Street Elbows
M. I.45° Street
Elbows M. I.

Tees C. I.



Tees M. I.



Crosses C. I.



Crosses M. I.



Reducers M. I.

Bushings
C. I.Faced Bushings
M. I.Plugs
C. I.Countersunk
Plugs C. I.Caps
M. I.Lock Nut
M. I.Faced Lock
Nut M. I.

MALLEABLE IRON

Size, inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, R. H.	\$0.06	0.07	0.08	0.10	0.15	0.22	0.25	0.35	0.50	0.90	1.50	2.25	3.00
Elbows, R. and L.	09	11	13	17	25	39	40	60	90	1.50	2.40	3.75	5.00
Elbows, galvanized, R. H.	08	09	11	14	20	32	40	60	90	1.50	2.40	3.75	5.00
45° Elbows, galvanized	08	10	12	18	26	36	54	82	1.25	2.50	3.25	4.50	6.75
Street Elbows, galvanized	12	15	20	25	40	50	80	1.25	1.90	3.25	4.75	6.75	3.50
Street Elbows, galvanized	10	12	15	20	25	40	50	80	1.50	2.25	3.50	5.00	6.75
Side Outlet Elbows	12	15	20	25	40	50	80	1.50	2.25	3.50	5.00	6.75	8.00
Tees	07	08	09	11	15	25	30	45	60	1.05	1.70	2.50	3.40
Tees, galvanized	09	10	12	16	20	38	50	70	1.00	1.90	3.00	4.25	5.75
Crosses	09	10	16	20	30	40	60	90	1.00	1.75	3.00	3.25	5.25
Crosses, galvanized	12	14	25	29	45	60	90	1.50	2.75	4.50	8.00	8.00	8.00
Bushings	04	04	04	05	06	07	09	14	21	30	40	50	60
Reducers	05	06	07	10	16	20	28	45	70	1.00	1.50	1.85	1.85
Reducers, galvanized	08	10	10	15	25	35	45	75	1.05	1.65	2.40	3.06	3.06
Caps, galvanized	03	04	05	08	12	16	24	32	45	75	1.00	1.00	1.20
Lock Nuts	02	03	04	05	07	09	11	18	25	35	45	60	60
Lock Nuts, galvanized	03	04	05	07	10	14	20	30	40	50	60	70	80

CAST IRON

Size, inches	1/8	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Elbows, R. H.	\$0.05	06	06	08	10 1/2	16	30	28	50	75	1.05	1.20	1.75	2.00	2.75
Elbows, R. and L.	06	06	07	09	12	18	23	32	60	85	1.20	1.40	2.00	2.30	3.15
Elbows, galvanized, R. H.	10	10	12	16	21	32	40	56	1.00	1.50	2.10	2.40	3.50	4.00	5.50
Reducing Elbows	07	07	09	12	18	23	32	60	85	1.20	1.40	2.00	2.30	3.15	3.15
45° Elbows	06	07	10	12	19	24	34	60	90	1.25	1.45	2.20	2.50	3.45	3.45
45° Elbows, galvanized	12	14	20	24	38	48	68	1.20	1.90	2.50	2.50	4.40	5.00	6.90	6.90
Tees	08	08	09	12	15	23	29	41	73	1.10	1.50	1.75	2.55	3.00	4.00
Tees, galvanized	16	16	18	24	30	46	58	82	1.46	2.30	3.00	3.60	5.10	6.00	8.00
Reducing Tees	08	08	10	14	17	27	33	47	83	1.25	1.75	2.00	2.95	3.50	4.60
Crosses	16	22	27	42	53	75	1.30	2.00	2.70	3.15	4.40	5.50	7.25	7.25	7.25
Crosses, galvanized	32	44	54	84	1.06	1.50	2.60	4.00	5.40	6.30	9.20	11.00	14.50	14.50	14.50
Reducing Crosses	18	25	30	46	60	83	1.45	2.30	3.00	3.50	5.10	6.00	8.00	8.00	8.00
Bushings	04	04	05	06	07	09	14	21	30	40	50	75	93	1.25	1.25
Bushings, galvanized	08	08	10	12	14	18	28	42	60	90	1.00	1.50	1.85	2.50	2.50
Plugs	02	02	03	04	05	07	10	18	25	38	42	65	88	1.20	1.20
Plugs, galvanized	04	04	06	08	10	14	20	36	50	76	84	1.30	1.75	2.40	2.40
Reducers	04	04	05	06	07	09	14	21	30	40	50	75	93	1.25	1.25
Reducers, galvanized	08	08	10	12	14	18	28	42	60	90	1.00	1.50	1.85	2.50	2.50
Caps	02	02	03	04	05	07	10	18	25	38	42	65	88	1.20	1.20
Caps, galvanized	04	04	06	08	10	14	20	36	50	76	84	1.30	1.75	2.40	2.40
Lock Nuts	02	02	03	04	05	07	10	18	25	38	42	65	88	1.20	1.20
Lock Nuts, galvanized	04	04	06	08	10	14	20	36	50	76	84	1.30	1.75	2.40	2.40

RETURN BENDS

Malleable Iron
Close PatternMalleable Iron
Medium PatternCast Iron
Close PatternCast Iron
Open PatternCast Iron
Back OutletMALLEABLE IRON
Close or Medium Pattern

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right hand.....each	.18	.25	.35	.50	.75	1.00
Left hand....."	.23	.30	.45	.60	.90	1.25
Right and left....."	.23	.30	.45	.60	.90	1.25
Center to center.....inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$
Center to center, medium....."	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$

MALLEABLE IRON
Open Pattern

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Right hand.....each	.20	.30	.50	.65	.85	1.25	2.00	3.00
Left hand....."	.25	.38	.60	.80	1.05	1.55	2.50	3.75
Right and left....."	.25	.38	.60	.80	1.05	1.55	2.50	3.75
Center to center.....inches	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	$3\frac{1}{4}$	4	$4\frac{1}{2}$	5

MALLEABLE IRON
Special Wide Pattern

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price	each	.25	1.00	1.25	1.25	2.00	2.00
Center to center	inches	$1\frac{1}{2}$	4	6	6	6	6

Size	inches	2	3	4	6
Price	each	3.00	5.00	5.00	8.00
Center to center	inches	5	$7\frac{1}{2}$	8	6

CAST IRON
Close Pattern

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price, right hand.....each	.18	.20	.22	.28	.40	.57	1.20	1.70	5.00
" right and left....."	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
" left hand....."	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
Center to center.....in.	$1\frac{1}{4}$	$1\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$4\frac{1}{2}$

CAST IRON
Open Pattern

Size.....inches	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price, right hand.....each	.26	.30	.40	.55	.80	1.25	2.20	6.50
" right and left....."	.30	.35	.46	.64	.92	1.55	2.50	
Center to center.....inches	$1\frac{1}{4}$	$1\frac{1}{2}$	3	$3\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$

CAST IRON
Back Outlet

Size.....inches	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, right hand.....each	.38	.42	.60	.80	1.15	2.00	3.00
" right and left....."	.42	.48	.70	.95	1.30	2.30	3.50
Center to center.....inches	$1\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$

CAST IRON BRANCH TEES



Fig. 1



Fig. 2



Fig. 3

All openings in Branch Tees for Circulation are tapped right hand.
Branch Tees for Box Coils are always tapped left hand in branch and right hand in back inlet.
The run and back opening of Branch Tees are tapped the same size branches, unless otherwise ordered.

Number of Branches	1 INCH BRANCH TEES 2½ INCH CENTER TO CENTER			1½ INCH BRANCH TEES 3 INCH CENTER TO CENTER			1¼ INCH BRANCH TEES 3½ INCH CENTER TO CENTER			2 INCH BRANCH TEES 4½ INCH CENTER TO CENTER		
	1 inch or 1½ inch Run	1½ inch Run	2 inch Run	1¼ inch or 1½ inch Run	2 inch Run	2½ inch Run	1½ inch or 2 inch Run	2½ inch Run	3 inch Run	2 inch Run	2½ inch or 3 inch Run	3½ inch Run
3	\$0.90	\$1.00	\$1.15									
4	1.05	1.15	1.35	\$1.05	\$1.90	\$ 2.40	\$2.70	\$ 3.45	\$ 3.80	\$ 5.25	\$ 5.75	\$ 6.25
5	1.15	1.30	1.60	2.00	2.40	2.85	3.35	4.15	4.60	6.40	7.00	7.75
6	1.35	1.45	1.85	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50	9.25
7	1.60	1.75	2.10	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75	10.75
8	1.90	2.20	2.45	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75	13.00
9	2.20	2.45	2.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75	14.00
10	2.65	2.90	3.40	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50	15.00
11		3.30	4.00	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00	16.50
12		4.50	4.80	5.00	6.25	7.25	8.00	9.75	10.75			
13		4.75	5.10	5.25	6.50	7.65	8.50	10.50	11.50			
14		5.50	6.00	6.00	7.00	8.25						
15		7.00	7.25	6.75	7.75	9.00						
16		7.50	7.75	7.50	8.50	9.75						
17		8.00	8.25	8.50	9.50	10.75						

1 inch Branch Tees, 1 inch or 1½ inch run, are 1¼ inches inside diameter.
1 inch Branch Tees, 1½ inch or 2 inch run are 2¼ inches inside diameter.
1½ inch Branch Tees are all 2½ inches inside diameter.
1¼ inch Branch Tees are all 2½ inches inside diameter.
2 inch Branch Tees are all 3½ inches inside diameter.

WROUGHT IRON NIPPLES



Close



Shoulder

PLAIN RIGHT HAND NIPPLES

LENGTH, INCHES			Size, inches	PRICES			PRICE OF EXTRA LONG NIPPLES			
Close	Short	Long		Close	Short	Long	4 in.	5 in.	6 in.	7 in.
1/2	1 1/2	2 1/2	1/2	1/2	1 1/2	2 1/2	\$0.04	\$0.06	\$0.07	\$0.08
1 1/2	2 1/2	3 1/2	3/4	3/4	2 1/2	3 1/2	.04	.06	.07	.08
2 1/2	3 1/2	4 1/2	1	1	3 1/2	4 1/2	.04	.06	.07	.08
3 1/2	4 1/2	5 1/2	1 1/4	1 1/4	4 1/2	5 1/2	.05	.07	.08	.10
4 1/2	5 1/2	6 1/2	1 1/2	1 1/2	5 1/2	6 1/2	.05	.07	.08	.10
5 1/2	6 1/2	7 1/2	1 3/4	1 3/4	6 1/2	7 1/2	.06	.08	.09	.11
6 1/2	7 1/2	8 1/2	2	2	7 1/2	8 1/2	.06	.08	.09	.11
7 1/2	8 1/2	9 1/2	2 1/4	2 1/4	8 1/2	9 1/2	.07	.09	.10	.12
8 1/2	9 1/2	10 1/2	2 1/2	2 1/2	9 1/2	10 1/2	.07	.09	.10	.12
9 1/2	10 1/2	11 1/2	2 3/4	2 3/4	10 1/2	11 1/2	.08	.10	.11	.13
10 1/2	11 1/2	12 1/2	3	3	11 1/2	12 1/2	.08	.10	.11	.13
11 1/2	12 1/2	13 1/2	3 1/4	3 1/4	12 1/2	13 1/2	.09	.11	.12	.14
12 1/2	13 1/2	14 1/2	3 1/2	3 1/2	13 1/2	14 1/2	.09	.11	.12	.14
13 1/2	14 1/2	15 1/2	3 3/4	3 3/4	14 1/2	15 1/2	.10	.12	.13	.15
14 1/2	15 1/2	16 1/2	4	4	15 1/2	16 1/2	.10	.12	.13	.15
15 1/2	16 1/2	17 1/2	4 1/4	4 1/4	16 1/2	17 1/2	.11	.13	.14	.16
16 1/2	17 1/2	18 1/2	4 1/2	4 1/2	17 1/2	18 1/2	.11	.13	.14	.16
17 1/2	18 1/2	19 1/2	4 3/4	4 3/4	18 1/2	19 1/2	.12	.14	.15	.17
18 1/2	19 1/2	20 1/2	5	5	19 1/2	20 1/2	.12	.14	.15	.17
19 1/2	20 1/2	21 1/2	5 1/4	5 1/4	20 1/2	21 1/2	.13	.15	.16	.18
20 1/2	21 1/2	22 1/2	5 1/2	5 1/2	21 1/2	22 1/2	.13	.15	.16	.18
21 1/2	22 1/2	23 1/2	5 3/4	5 3/4	22 1/2	23 1/2	.14	.16	.17	.19
22 1/2	23 1/2	24 1/2	6	6	23 1/2	24 1/2	.14	.16	.17	.19
23 1/2	24 1/2	25 1/2	6 1/4	6 1/4	24 1/2	25 1/2	.15	.17	.18	.20
24 1/2	25 1/2	26 1/2	6 1/2	6 1/2	25 1/2	26 1/2	.15	.17	.18	.20
25 1/2	26 1/2	27 1/2	6 3/4	6 3/4	26 1/2	27 1/2	.16	.18	.19	.21
26 1/2	27 1/2	28 1/2	7	7	27 1/2	28 1/2	.16	.18	.19	.21
27 1/2	28 1/2	29 1/2	7 1/4	7 1/4	28 1/2	29 1/2	.17	.19	.20	.22
28 1/2	29 1/2	30 1/2	7 1/2	7 1/2	29 1/2	30 1/2	.17	.19	.20	.22
29 1/2	30 1/2	31 1/2	7 3/4	7 3/4	30 1/2	31 1/2	.18	.20	.21	.23
30 1/2	31 1/2	32 1/2	8	8	31 1/2	32 1/2	.18	.20	.21	.23
31 1/2	32 1/2	33 1/2	8 1/4	8 1/4	32 1/2	33 1/2	.19	.21	.22	.24
32 1/2	33 1/2	34 1/2	8 1/2	8 1/2	33 1/2	34 1/2	.19	.21	.22	.24
33 1/2	34 1/2	35 1/2	8 3/4	8 3/4	34 1/2	35 1/2	.20	.22	.23	.25
34 1/2	35 1/2	36 1/2	9	9	35 1/2	36 1/2	.20	.22	.23	.25
35 1/2	36 1/2	37 1/2	9 1/4	9 1/4	36 1/2	37 1/2	.21	.23	.24	.26
36 1/2	37 1/2	38 1/2	9 1/2	9 1/2	37 1/2	38 1/2	.21	.23	.24	.26
37 1/2	38 1/2	39 1/2	9 3/4	9 3/4	38 1/2	39 1/2	.22	.24	.25	.27
38 1/2	39 1/2	40 1/2	10	10	39 1/2	40 1/2	.22	.24	.25	.27
39 1/2	40 1/2	41 1/2	10 1/4	10 1/4	40 1/2	41 1/2	.23	.25	.26	.28
40 1/2	41 1/2	42 1/2	10 1/2	10 1/2	41 1/2	42 1/2	.23	.25	.26	.28
41 1/2	42 1/2	43 1/2	10 3/4	10 3/4	42 1/2	43 1/2	.24	.26	.27	.29
42 1/2	43 1/2	44 1/2	11	11	43 1/2	44 1/2	.24	.26	.27	.29
43 1/2	44 1/2	45 1/2	11 1/4	11 1/4	44 1/2	45 1/2	.25	.27	.28	.30
44 1/2	45 1/2	46 1/2	11 1/2	11 1/2	45 1/2	46 1/2	.25	.27	.28	.30
45 1/2	46 1/2	47 1/2	11 3/4	11 3/4	46 1/2	47 1/2	.26	.28	.29	.31
46 1/2	47 1/2	48 1/2	12	12	47 1/2	48 1/2	.26	.28	.29	.31
47 1/2	48 1/2	49 1/2	12 1/4	12 1/4	48 1/2	49 1/2	.27	.29	.30	.32
48 1/2	49 1/2	50 1/2	12 1/2	12 1/2	49 1/2	50 1/2	.27	.29	.30	.32
49 1/2	50 1/2	51 1/2	12 3/4	12 3/4	50 1/2	51 1/2	.28	.30	.31	.33
50 1/2	51 1/2	52 1/2	13	13	51 1/2	52 1/2	.28	.30	.31	.33
51 1/2	52 1/2	53 1/2	13 1/4	13 1/4	52 1/2	53 1/2	.29	.31	.32	.34
52 1/2	53 1/2	54 1/2	13 1/2	13 1/2	53 1/2	54 1/2	.29	.31	.32	.34
53 1/2	54 1/2	55 1/2	13 3/4	13 3/4	54 1/2	55 1/2	.30	.32	.33	.35
54 1/2	55 1/2	56 1/2	14	14	55 1/2	56 1/2	.30	.32	.33	.35
55 1/2	56 1/2	57 1/2	14 1/4	14 1/4	56 1/2	57 1/2	.31	.33	.34	.36
56 1/2	57 1/2	58 1/2	14 1/2	14 1/2	57 1/2	58 1/2	.31	.33	.34	.36
57 1/2	58 1/2	59 1/2	14 3/4	14 3/4	58 1/2	59 1/2	.32	.34	.35	.37
58 1/2	59 1/2	60 1/2	15	15	59 1/2	60 1/2	.32	.34	.35	.37
59 1/2	60 1/2	61 1/2	15 1/4	15 1/4	60 1/2	61 1/2	.33	.35	.36	.38
60 1/2	61 1/2	62 1/2	15 1/2	15 1/2	61 1/2	62 1/2	.33	.35	.36	.38
61 1/2	62 1/2	63 1/2	15 3/4	15 3/4	62 1/2	63 1/2	.34	.36	.37	.39
62 1/2	63 1/2	64 1/2	16	16	63 1/2	64 1/2	.34	.36	.37	.39
63 1/2	64 1/2	65 1/2	16 1/4	16 1/4	64 1/2	65 1/2	.35	.37	.38	.40
64 1/2	65 1/2	66 1/2	16 1/2	16 1/2	65 1/2	66 1/2	.35	.37	.38	.40
65 1/2	66 1/2	67 1/2	16 3/4	16 3/4	66 1/2	67 1/2	.36	.38	.39	.41
66 1/2	67 1/2	68 1/2	17	17	67 1/2	68 1/2	.36	.38	.39	.41
67 1/2	68 1/2	69 1/2	17 1/4	17 1/4	68 1/2	69 1/2	.37	.39	.40	.42
68 1/2	69 1/2	70 1/2	17 1/2	17 1/2	69 1/2	70 1/2	.37	.39	.40	.42
69 1/2	70 1/2	71 1/2	17 3/4	17 3/4	70 1/2	71 1/2	.38	.40	.41	.43
70 1/2	71 1/2	72 1/2	18	18	71 1/2	72 1/2	.38	.40	.41	.43
71 1/2	72 1/2	73 1/2	18 1/4	18 1/4	72 1/2	73 1/2	.39	.41	.42	.44
72 1/2	73 1/2	74 1/2	18 1/2	18 1/2	73 1/2	74 1/2	.39	.41	.42	.44
73 1/2	74 1/2	75 1/2	18 3/4	18 3/4	74 1/2	75 1/2	.40	.42	.43	.45
74 1/2	75 1/2	76 1/2	19	19	75 1/2	76 1/2	.40	.42	.43	.45
75 1/2	76 1/2	77 1/2	19 1/4	19 1/4	76 1/2	77 1/2	.41	.43	.44	.46
76 1/2	77 1/2	78 1/2	19 1/2	19 1/2	77 1/2	78 1/2	.41	.43	.44	.46
77 1/2	78 1/2	79 1/2	19 3/4	19 3/4	78 1/2	79 1/2	.42	.44	.45	.47
78 1/2	79 1/2	80 1/2	20	20	79 1/2	80 1/2	.42	.44	.45	.47
79 1/2	80 1/2	81 1/2	20 1/4	20 1/4	80 1/2	81 1/2	.43	.45	.46	.48
80 1/2	81 1/2	82 1/2	20 1/2	20 1/2	81 1/2	82 1/2	.43	.45	.46	.48
81 1/2	82 1/2	83 1/2	20 3/4	20 3/4	82 1/2	83 1/2	.44	.46	.47	.49
82 1/2	83 1/2	84 1/2	21	21	83 1/2	84 1/2	.44	.46	.47	.49
83 1/2	84 1/2	85 1/2	21 1/4	21 1/4	84 1/2	85 1/2	.45	.47	.48	.50
84 1/2	85 1/2	86 1/2	21 1/2	21 1/2	85 1/2	86 1/2	.45	.47	.48	.50
85 1/2	86 1/2	87 1/2	21 3/4	21 3/4	86 1/2	87 1/2	.46	.48	.49	.51
86 1/2	87 1/2	88 1/2	22	22	87 1/2	88 1/2	.46	.48	.49	.51
87 1/2	88 1/2	89 1/2	22 1/4	22 1/4	88 1/2	89 1/2	.47	.49	.50	.52
88 1/2	89 1/2	90 1/2	22 1/2	22 1/2	89 1/2	90 1/2	.47	.49	.50	.52
89 1/2	90 1/2	91 1/2	22 3/4	22 3/4	90 1/2	91 1/2	.48	.50	.51	.53
90 1/2	91 1/2	92 1/2	23	23	91 1/2	92 1/2	.48	.50	.51	.53
91 1/2	92 1/2	93 1/2	23 1/4	23 1/4	92 1/2	93 1/2	.49	.51	.52	.54
92 1/2	93 1/2	94 1/2	23 1/2	23 1/2	93 1/2	94 1/2	.49	.51	.52	.54
93 1/2	94 1/2	95 1/2	23 3/4	23 3/4	94 1/2	95 1/2	.50	.52	.53	.55
94 1/2	95 1/2	96 1/2	24	24	95 1/2	96 1/2	.50	.52	.53	.55
95 1/2	96 1/2	97 1/2	24 1/4	24 1/4	96 1/2	97 1/2	.51	.53	.54	.56
96 1/2	97 1/2	98 1/2	24 1/2	24 1/2	97 1/2	98 1/2	.51	.53	.54	.56
97 1/2	98 1/2	99 1/2	24 3/4	24 3/4	98 1/2	99 1/2	.52	.54	.55	.57
98 1/2	99 1/2	100 1/2	25	25	99 1/2	100 1/2	.52	.54	.55	.57
99 1/2	100 1/2	101 1/2	25 1/4	25 1/4	100 1/2	101 1/2	.53	.55	.56	.58
100 1/2	101 1/2	102 1/2	25 1/2	25 1/2	101 1/2	102 1/2	.53	.55	.56	.58
101 1/2	102 1/2	103 1/2	25 3/4	25 3/4	102 1/2	103 1/2	.54	.56	.57	.59
102 1/2	103 1/2	104 1/2	26	26	103 1/2	104 1/2	.54	.56	.57	.59
103 1/2	104 1/2	105 1/2	26 1/4	26 1/4	104 1/2	105 1/2	.55	.57	.58	.60
104 1/2	105 1/2	106 1/2	26 1/2	26 1/2	105 1/2	106 1/2	.55	.57	.58	.60
105 1/2	106 1/2	107 1/2	26 3/4	26 3/4	106 1/2	107 1/2	.56	.58	.59	.61
106 1/2	107 1/2	108 1/2	27	27	107 1/2	108 1/2	.56	.58	.59	.61
107 1/2	108 1/2	109 1/2	27 1/4	27 1/4	108 1/2	109 1/2	.57	.59	.60	.62
108 1/2	109 1/2	110 1/2	27 1/2	27 1/2	109 1/2	110 1/2	.57	.59	.60	.62

H.Channon Company. Chicago.

BARCO FLEXIBLE JOINT

FOR STEAM, AIR, GAS AND LIQUIDS



90° Angle Joint

For pipe lines conveying steam, compressed air, gas or liquids under any desired pressure. Have no ground seats or abrasive wearing parts in the joints.

The front and back gaskets are renewable and reversible, and are made of a hard-moulded non-metallic material, which is tough and has great wearing strength and when worn can be replaced at slight expense.



Straight Joint, Female Ends

Standard Flexible Joints—Screw Ends.

Standard Flexible Joints—Flange Ends.

Size	Straight	Angle	Size	Price, Each	Diameter of Flanges, inches	Length Face to Face, inches
$\frac{1}{4}$	\$ 6.75	\$ 7.25	4	\$ 45.00	9	11
$\frac{3}{8}$	7.00	7.50	5	52.00	10	12 $\frac{1}{2}$
$\frac{1}{2}$	7.50	8.00	6	58.50	11	13 $\frac{3}{4}$
$\frac{3}{4}$	8.80	9.30	8	100.00	13 $\frac{1}{2}$	20 $\frac{3}{8}$
1	9.90	10.40	10	132.00	16	22
1 $\frac{1}{4}$	12.30	12.80	12	164.50	19	22
1 $\frac{1}{2}$	14.00	14.50	14	198.00	21	24
1 $\frac{1}{2}$ x $\frac{3}{4}$	14.00	14.50	16	230.00	23 $\frac{1}{2}$	18 $\frac{1}{4}$
2	17.50	19.50	18	297.00	25	30
2 $\frac{1}{2}$	21.00	23.00	20	336.00	27 $\frac{1}{2}$	32
3	26.30	28.30	24	400.00	32	36
4	35.10	38.10	30	676.00	38	42 $\frac{3}{4}$
5	43.90	47.90	36	1005.00	45 $\frac{3}{4}$	41 $\frac{1}{2}$
6	58.50	63.50	....	.....	.....	.....

Brass joints made in sizes $\frac{1}{4}$ in. to $2\frac{1}{2}$ in., male and female ends. Iron joints made in sizes $\frac{1}{4}$ in. to 6 in., female ends only unless otherwise ordered; sizes up to 4 in., made of Mall. Iron. Our Standard Joints made to stand 150 to 200 lbs. pressure. Extra heavy joints made for high pressure according to requirements.

MORAN FLEXIBLE JOINTS

For Steam, Air, Gas or Liquids. Only 3 Parts, No Packing, No Springs, Always Reseating. Positively Tight under All Pressures



No. 1. Straight Joint for Steam, Gas and Air



No. 3. Special Liquid Joint Adjustable and Detachable without the Use of Tools



No. 2. Angle Joint for Steam, Gas and Air

Size, Inches	Net Price Nos. 1 and 3 Straight, Each	Net Price No. 2 Angle, Each	Size, Inches	Net Price Nos. 1 and 3 Straight, Each	Net Price No. 2 Angle, Each	Size, Inches	Net Price Nos. 1 and 3 Straight, Each	Net Price No. 2 Angle, Each
$\frac{3}{8}$	\$3.00	\$3.25	2	\$ 7.50	\$ 8.75	5	\$ 18.75	\$ 20.75
$\frac{1}{2}$	3.25	3.50	2 $\frac{1}{2}$	9.00	10.50	6	25.00	27.50
$\frac{3}{4}$	3.75	4.00	3	11.25	12.25	7	50.00	55.00
1	4.25	4.50	3 $\frac{1}{2}$	14.00	15.50	8	75.00	82.50
1 $\frac{1}{4}$	5.25	5.50	4	15.00	16.75	9	95.00	104.50
1 $\frac{1}{2}$	6.00	6.25	4 $\frac{1}{2}$	18.75	20.75	10	115.00	126.50

All standard Pipe Thread 7 to 10 inches furnished threaded or flanged.

In ordering state whether for steam, air or liquid and under what pressure.

PIPE HANGERS With Sectional Solid Ring



Style "R" Style "S" Expansion

Pipe can be run and supported upon temporary wood hangers, and when in proper line these Sectional Hangers can be conveniently applied.

Styles "R" and "S"

Size.....inches	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price.....each	\$0.32	.33	.35	.45	.55	.65	.80
Tapped.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Size.....inches	3 $\frac{1}{2}$	4	5	6	8	10	12
Price.....each	\$1.00	1.15	2.00	2.50	3.50	4.50	6.00
Tapped.....inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$

Expansion Style

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price.....complete	\$0.17	.17	.18	.19	.25	.29	.36	.44
Tapped.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Size.....inches	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	10
Price.....complete	\$0.55	.63	.90	1.12	1.35	1.80	2.25	3.00
Tapped.....inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$

Parts of Expansion Pipe Hangers

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Plates.....each	\$0.08	.08	.08	.08	.09	.09	.10	.10
Buttons.....	.06	.06	.06	.06	.07	.07	.08	.08
Rings.....	.08	.08	.12	.15	.20	.25	.30	.40
Size.....inches	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	10
Plates.....each	\$0.10	.10	.10	.10	.10	.10	.10	.10
Buttons.....	.08	.08	.08	.08	.08	.08	.08	.08
Rings.....	.60	.60	.80	1.00	1.25	1.70	2.15	3.00

Expansion pipe rod and turn buckles are extra.

HOOK PLATES



Number of Hooks.....	1	2	3	4	5	6
For 1 in. pipe, 2 $\frac{1}{2}$ in. bet. centers, ea.	\$0.09	.18	.23	.26	.32	.38
For 1 $\frac{1}{2}$ in. pipe, 3 in. bet. centers, "	.10	.21	.27	.32	.41	.52
For 1 $\frac{1}{2}$ in. pipe, 3 $\frac{1}{2}$ in. bet. centers, "	.15	.28	.43	.58	.72	.88
For 2 in. pipe, 4 $\frac{1}{2}$ in. bet. centers, "	.22	.43	.65	.90	1.15	1.35

EXPANSION HOOK PLATES



Number of Hooks.....	1	2	3	4	5	6
For 1 in. pipe, 2 $\frac{1}{2}$ in. bet. centers, ea.	\$0.15	.25	.35	.50	.60	.70
For 1 $\frac{1}{2}$ in. pipe, 3 in. bet. centers, "	.17	.27	.40	.60	.70	.80
For 1 $\frac{1}{2}$ in. pipe, 3 $\frac{1}{2}$ in. bet. centers, "	.25	.40	.60	.75	.90	1.00
For 2 in. pipe, 4 $\frac{1}{2}$ in. bet. centers, "	.40	.60	.85	1.00	1.35	1.55

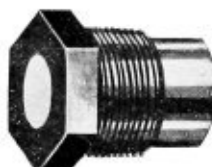
When hook plates are ordered, specifying a greater number of hooks than listed above, we will send two.

BEAM HOOKS, LONG SHANK



Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price.....each	.13	.15	.18	.22	.24	.35	.65	.90

FUSIBLE FLUGS



Extra Long

Regular Length

Made of bronze, filled with pure Banca tin, fulfilling U. S. Government specifications; to be inserted so the small end of Banca tin is exposed to the fire.

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Nos. 750 and 751.....	\$0.40	.75	1.00	1.50	2.00	2.00
No. 752.....	1.20	1.60	2.00	3.00	4.00	6.00

Outside type sent unless otherwise specified.



MALLEABLE PIPE RINGS

All screw holes drilled and countersunk.

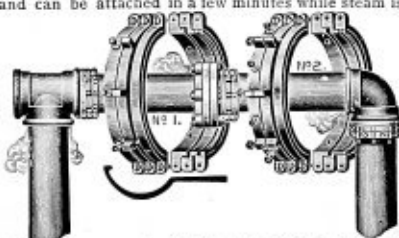
PRICE PER 100 PIECES

Size, inches.....	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Plain iron.....	5.00	5.00	5.80	6.75	7.50	10.00	14.00
Galvanized iron.....	6.50	6.50	7.00	8.00	9.00	12.00	16.00

CLIMAX STEAM JOINT CLAMPS

For Repairing Leaks at Joints Where Pipes are Screwed into Fittings

A permanent repair clamp, taking up about 2 $\frac{1}{2}$ inches space on pipe, and can be attached in a few minutes while steam is in the pipe.



No. 1 clamps are made for $\frac{1}{2}$ -inch to 12-inch pipe. They are fastened with set screws and adjusted with spanner wrench.

No. 2 clamps are made for 4-inch to 24-inch pipe. They are fastened with set screws and adjusted with set screws.

Size Pipe	Price Each	Size Pipe	Price Each	Size Pipe	Price Each
$\frac{1}{2}$	\$1.50	3	\$4.50	7	\$10.50
1	1.50	3 $\frac{1}{2}$	5.25	8	13.00
1 $\frac{1}{4}$	1.90	4	6.00	9	15.75
1 $\frac{1}{2}$	2.25	4 $\frac{1}{2}$	6.75	10	18.75
2	3.00	5	7.50	12	22.50
2 $\frac{1}{2}$	3.75	6	9.00		

In ordering, state size of pipe and for what it is used, viz.: steam, water, air, gas or ammonia.

EMERGENCY PIPE CLAMP

For Repairing Leaks and Splits in Pipe



A malleable clamp that can be attached in a moment to steel, iron, brass or lead pipe.

Size of pipe, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Length over all.....	3 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6
Price each.....	.40	.45	.50	.60	.70	.80	1.00	1.25	1.50	2.00

CAST IRON FLANGES

Not Faced



Common Flange



Floor Flange

Size, inches	Price, Each	Size, inches	Price, Each	Size, inches	Price, Each	Size, inches	Price, Each	Size, inches	Price, Each
3/4 x 3	* 10	2 x 5 1/2	* 35	3 x 6 1/2	50	3 1/2 x 8 1/2	1.00	5 x 10	1.50
1 x 3 1/2	* 15	1 x 6	.42	4 x 7	.62	4 x 8 1/2	1.00	6 x 10	1.50
1 1/4 x 3 1/2	* 15	1 1/4 x 6	.40	2 1/2 x 7	.62	3 x 9	1.15	4 1/2 x 11	1.75
1 1/2 x 4	* 16	2 x 6	.42	3 x 7 1/2	.75	4 x 9	1.15	5 x 11	1.75
1 3/4 x 4	* 16	2 1/2 x 6	.42	3 x 8	.90	4 1/2 x 9	1.15	5 x 12	2.20
1 1/2 x 4 1/2	* 16	2 x 6 1/2	.50	2 1/2 x 8	.90	4 1/2 x 9 1/2	1.25	6 x 12	2.20
1 3/4 x 4 1/2	* 16	2 1/2 x 6 1/2	.50	3 x 8	.90	3 1/2 x 10	1.50	6 x 12 1/2	2.20
1 x 5	.30			3 1/2 x 8	.90	4 x 10	1.50	6 x 13	2.50
1 1/4 x 5	.30			4 x 8	.90	4 1/2 x 10	1.50	6 x 13 1/2	2.50
1 1/2 x 5	.30							6 x 14	3.25

Those marked * are Floor Flanges, drilled for screw.
The above is considered a complete list. Other sizes made to order.

STANDARD COMPANION FLANGES

Cast Iron and Malleable Iron for Steam Working
Pressures up to 125 Pounds

Back View
Showing Hub

Smooth Face

Size, inches	CAST IRON		MALLEABLE IRON		Bolts for One Joint, Per Set	Threading Pipe, Making on & Refacing Not Including Flange, Net, Each
	Faced, Each	Faced and Drilled Each	Faced, Each	Faced and Drilled Each		
1 x 4	\$1.00	\$1.25	\$2.00	\$2.50	\$0.25	\$0.40
1 1/4 x 4 1/2	1.05	1.35	2.10	2.70	.25	.40
1 1/2 x 5	1.10	1.40	2.20	2.80	.25	.45
2 x 6	1.20	1.50	2.40	3.00	.25	.50
2 1/2 x 7	1.40	2.00	2.80	4.00	.25	.55
3 x 7 1/2	1.60	2.25	3.20	4.50	.25	.60
3 1/2 x 8 1/2	1.80	2.50	3.60	5.00	.25	.65
4 x 9	2.15	3.00	4.30	6.00	.35	.70
4 1/2 x 9 1/2	2.50	3.35	5.00	6.70	.70	.75
5 x 10	3.20	4.00	6.40	8.00	.70	.85
6 x 11	4.00	4.80	8.00	10.00	1.00	1.10
7 x 12 1/2	4.35	5.75	8.70	11.00	.75	1.10
8 x 13 1/2	5.00	6.50	10.00	13.00	.75	1.20
9 x 15	6.75	8.25	13.50	16.50	1.15	1.55
10 x 16	7.75	9.25	15.50	18.50	1.70	1.70
12 x 19	10.50	12.50	21.00	25.00	1.70	2.40
14 x 21	13.75	16.00	27.50	32.00	2.50	3.10
15 x 21	15.00	21.00	36.00	42.00	2.50	3.10
15 x 22 1/2	15.00	21.00	36.00	42.00	3.30	3.25
16 x 22 1/2	22.50	26.00	45.00	54.00	3.30	4.25
18 x 25	27.50	31.00	55.00	62.00	4.00	4.25
20 x 27 1/2	30.00	34.00	60.00	68.00	6.20	7.50
22 x 29 1/2	33.75	39.00	67.50	78.00	8.40	8.50
24 x 32	41.00	46.00	82.00	92.00	8.40	10.00

Furnished smooth faced and not drilled, unless otherwise specified.

Y BENDS



Cast Iron



Malleable Iron

Cast Iron

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price.....each	\$0.20	.28	.34	.54	.66	.94	1.06
Price Galvanized....."	.40	.56	.68	1.08	1.32	1.88	3.32

Size.....inches	3	3 1/2	4	5 1/2	5	6
Price.....each	\$2.50	3.50	4.00	5.20	7.00	9.20
Price Galvanized....."	5.00	7.00	8.00	11.80	14.00	18.40

Malleable Iron

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Price.....each	\$0.40	.50	.60	.80	1.00	1.70	2.00	4.00	5.50
Price Galvanized....."	.60	.75	.90	1.25	1.50	2.50	3.00	6.00	8.25

60° Y BENDS

Malleable Iron

Size.....inches	2x2	2x1 1/2
Price.....each	\$1.70	1.70
Price Galvanized....."	2.50	2.50

CEILING PLATES



Split

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Price.....each	\$0.22	.28	.32	.40	.50	.65
Size.....inches	3	3 1/2	4	5	6	8
Price.....each	\$0.90	1.00	1.20	2.00	2.50	3.75

In One Piece

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2
Price.....each	\$0.11	.13	.16	.18	.23	.27
Size.....inches	2 1/2	3	3 1/2	4	5	6
Price.....each	\$0.36	.50	.55	.68	.85	1.25

CRANE FLOOR PLATES



This Floor Plate is made with grooves on the under side of the flange, as shown in cut, in order that it may be easily parted by a slight blow when required to be used in halves.



Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price.....each	\$0.06	.06	.08	.11	.14	.16	.24
Size.....inches	3	3 1/2	4	5	6	8	
Price.....each	\$0.20	.35	.42	.60	.75	1.75	

STANDARD BRASS AND IRON STEAM COCKS AND UNIONS

Brass cocks suitable for working pressures up to 100 pounds; iron cocks up to 125 pounds. Iron cocks made either all iron, iron with brass washers or iron with brass plugs. All iron cocks should never be used with steam or water, as the plug will stick in the barrel, making it almost impossible to turn. Iron cocks with brass washers are recommended for this service.



All Brass

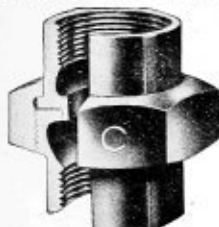


All Iron

Standard Malleable Iron Unions: for steam working pressures up to 150 pounds.
Malleable Iron Unions, brass to iron seat: for steam working pressures up to 200 pounds. Joints ground; no gaskets required; for steam, water and gas.

Extra Heavy Malleable Iron Unions: for steam working pressures up to 250 pounds. Extra heavy metallic gaskets, held in place by corrugated face unions.

Standard Brass Unions: joints ground; no gaskets required; not recommended for pressures above 150 pounds.
Semi-finished always sent unless otherwise ordered.



Standard Malle. Iron



Malle. Iron, Brass to Iron Seat



Malle. Iron, Ex. Heavy



Standard Brass

Size.....inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Standard Malleable Iron.....	\$0.18	\$0.20	\$0.22	\$0.27	\$0.33	\$0.46	\$0.58	\$0.75	\$1.55	\$2.10
Malleable Iron Brass to Iron Seat.....	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80
Malleable Iron Extra Heavy.....	.20	.24	.28	.35	.40	.56	.80	.95	2.00	2.75

BRASS

Size.....inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Plain.....	\$0.36	\$0.50	\$0.70	\$0.94	\$1.25	\$1.70	\$2.50	\$3.60	\$5.00	\$7.75
Semi-finished.....	.36	.50	.70	.94	1.25	1.70	2.50	3.60	6.00	7.75
Finished.....	.36	.50	.70	.90	1.25	1.70	2.50	3.60	6.00	7.75



*Cast Iron



*Malleable Iron

*Cast Iron
Extra Heavy1C. I. Extra Heavy
Iron to Brass Seat

CAST IRON—FOR WORKING PRESSURES UP TO 125 LBS.

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Diameter of Flanges.....inches	3	3 1/2	3 3/4	4 1/2	4 3/4	5 1/2	6	6 3/4
Number of Bolts.....	3	4	4	4	4	4	4	4
Price.....each	\$0.40	\$0.46	\$0.52	\$0.64	\$0.78	\$1.00	\$1.25	\$1.50

MALLEABLE IRON—FOR WORKING PRESSURES UP TO 125 LBS.

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Diameter of Flanges.....inches	2 3/4	3 3/4	3 3/4	4 3/4	5 1/2	6	6 3/4
Number of Bolts.....	3	4	4	4	4	4	4
Price.....each	\$1.60	\$1.60	\$2.00	\$2.50	\$3.00	\$3.50	\$4.40

CAST IRON, EXTRA HEAVY—FOR WORKING PRESSURES UP TO 250 LBS.

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Diameter of Flanges.....inches	3	3 1/4	3 3/4	4 1/4	4 3/4	5 1/2	6	6 3/4	7 1/2	8	8 3/4	9 1/2	10 1/2
Number of Bolts.....	3	4	4	4	4	5	6	6	6	7	8	8	9
Price.....each	\$0.60	\$0.70	\$0.80	\$1.00	\$1.15	\$1.50	\$1.90	\$2.25	\$2.70	\$3.15	\$4.00	\$4.75	\$6.00

CAST IRON, EXTRA HEAVY, IRON TO BRASS SEAT, FOR WORKING PRESSURES UP TO 250 LBS.

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Diameter of Flanges.....inches	2 3/4	3 3/4	3 3/4	4 3/4	5 1/2	6	6 3/4	7 1/2	8	8 3/4	9 1/2	10 1/2
Number of Bolts.....	4	4	4	4	5	5	6	6	7	8	8	9
Price.....each	\$0.60	\$0.80	\$1.20	\$1.60	\$2.00	\$2.30	\$4.80	\$6.00	\$7.50	\$8.75	\$10.00	\$12.50

*Faced; Gasket extra. †Ground Joint; no Gasket required.

VENTILATORS AND CHIMNEY CAPS

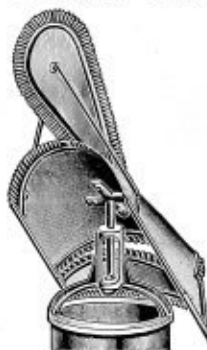
Galvanized Iron



Diam., inches	Price Each	Diam., inches	Price Each	Diam., inches	Price Each
2	\$1.00	6	\$ 3.40	18	\$ 27.00
2½	1.00	7	4.00	20	33.00
3	1.50	8	4.65	24	40.00
3½	1.50	9	5.20	30	65.00
4	1.75	10	5.75	36	120.00
4½	2.00	12	6.75	40	180.00
5	2.50	14	13.00	48	240.00
5½	2.85	16	20.00	60	360.00

Bases will be made to fit any roof or chimney, either square or oblong, of any size required, but the price of the bases are extra, according to size and quantity.

REVOLVING AND VENTILATING CHIMNEY CAPS



Iron mountings composed of two parts. No pins or wire required. Protects chimney from rain or sleet and prevents downward draught. Deflector creates strong upward draught and allows free passage of smoke.

Top Complete

Inches.....	6	7	8	9	10	12
Price per Doz.	\$24.00	\$26.00	\$28.00	\$32.00	\$34.00	\$40.00

Iron Mountings Without Cover

Inches.....	6	7	8	9	10	12
Price per Doz.	\$13.00	\$13.50	\$15.00	\$16.50	\$18.00	\$22.00

BOILER ROOM TOOLS

Wrought Iron

Any size or special design will be made to order.



Length, feet	Diam. of Bar, inches	PRICE EACH				
		Hoe	Slash Bar	Clinker Hook	Poker	
6	¾	\$1.50	\$1.20	\$1.50	\$1.00	
7	¾	1.85	1.55	2.00	1.35	
8	¾	2.25	1.90	2.30	1.65	
9	¾	3.25	2.85	2.85	2.00	
10	¾	3.85	3.80	3.60	2.50	
11	1	4.75	4.75	4.50	3.00	
12	1	5.75	5.75	5.50	3.50	

"ECONOMY" FIRING TOOLS

Iron Pipe Handles

We furnish the ends so that the purchaser may fit them to pipe any length desired. All blacksmithing done away with.



Cut your pipe the desired length, with a full thread at each end. Make up tight in Hoe, Hook or Slash Bar, screw on Grip, tighten set screws, and tool is ready for use.

Article	No.	Size, inches	Weight lbs.	Size Pipe for Handle, inch	Price with Grip	Price Each
Hoe	1	7x10	6½	1	\$3.05	\$2.85
Hook	1	9x6	4	1	3.05	2.85
Bar	1	15½x3½	6½	1	3.05	2.85
Grip	1	4x2	2½	1	.....	.20
Hoe	2	6¼x8	4¼	¾	2.85	2.65
Hook	2	8x6	2½	¾	2.85	2.65
Bar	2	14½x3	4½	¾	2.85	2.65
Grip	2	4x2	2½	¾	.....	.20

Full Set, including Fire Hoe, Fire Hook, Slash Bar and 3 Grips.
No. 1 to fit 1-inch Pipe Handle.....\$9.10
Full Set, including Fire Hoe, Fire Hook, Slash Bar and 3 Grips.
No. 2 to fit ¾-inch Pipe Handle.....\$8.50

THE "BURT" EXHAUST HEAD

The exhaust steam delivered through the pipe strikes the drum immediately over the inlet; this breaks up the steam into the smallest particles, condensing some of the vapor. The greatest volume rises to the small projector, is cast over to the flange, then forced down the inner wall, and coming out of the opening again rises to the top of the head and seeks its way out at the outlet pipe. When it comes in contact with the cold air, it is condensed into water, which drips down the wall, is caught on trough shaped lugs, drips down the tubes which carry it to the outlet pipe and thence out through the drip.



Sectional View

Size of Exhaust Pipe, inches	Height, inches	Diam., inches	Size of Drip, inches	Net Weight, lbs.	Price Each
1 or 1½	16	10	¾	18	\$ 8.00
2 or 2½	18	12	1	18	10.00
3 or 3½	20	14	1	35	12.00
4 or 4½	27	16	1	49	16.00
5	29	18	1¼	72	20.00
6	31	20	1¼	90	24.00
7	36	22	1¼	95	30.00
8	39	24	1½	125	36.00
9	43	26	1½	160	42.00
10	46	30	2	182	50.00
11	46	30	2	182	50.00
12	48	32	2	270	60.00
13	51	34	2	305	70.00
14	56	36	2½	385	80.00
15	59	39	2½	500	94.00
16	62	42	2½	559	100.00
17	69	45	3	610	108.00
18	76	48	3	700	120.00
19	79	50	3½	785	132.00
20	82	52	3½	900	144.00

Sizes up to 5 inches have heavy screwed base—sizes above 5 inches are fitted with heavy flanges. Large sizes quoted upon request.

THE "STANDARD" CENTRIFUGAL EXHAUST HEAD

The separation is made by the utilization of centrifugal force, as the incoming steam is given a whirling motion at the top of the head, the water and oil strike the sides, flow down to the drip outlet at the bottom and do not come in contact with the incoming steam.



Sectional View

Size of Exhaust Pipe, inches	Height, inches	Diam., inches	Drip, inches	Net Weight, lbs.	Price Each
1 or 1½	21	16	¾	16	\$ 8.00
2 or 2½	27	21	1	20	10.00
3 or 3½	31	25	1	41	12.00
4 or 4½	37	30	1	62	16.00
5	40	32	1¼	70	20.00
6	43	35	1¼	102	24.00
7	47	39	1¼	127	30.00
8	50	42	1½	190	36.00
9	53	45	1½	225	42.00
10	57	49	2	245	50.00
12	64	55	2	345	60.00
13	67	58	2	375	70.00
14	71	62	2½	400	80.00
15	74	65	2½	460	94.00
16	77	69	2½	525	100.00
18	85	76	3	600	120.00
20	95	82	3½	800	144.00

Heads up to 5 inches diameter have screwed base; above 5 inches have heavy flanges.

BROOMS

For Warehouse and Mill Use



All Corn Brooms

A strong, well made mill broom, of best grade of broom corn, reinforced by steel wire band above three twine bands.

Weight, per Dozen	Price, Each	Price, per Dozen
36	\$0.60	\$6.50
40	.70	7.50

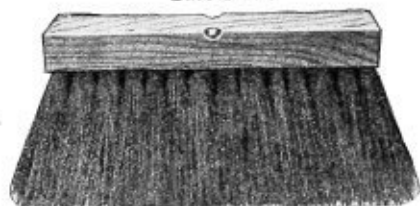
MIXED BROOMS

Made of best grade broom corn, together with enough rattan reed to make them strong and elastic. Three twine bands and one steel wire reinforcing band.

Weight, per Dozen	Price, Each	Price, Dozen
36	\$0.70	\$7.00
40	.80	8.00
48	.90	9.00

STREET OR PUSH BROOMS

Bass Fibre



Made of best quality African fibre or coir, with five-foot handles.

Price Without Handles

Length, Head	4 Row		6 Row		Handles Extra, Each
	Each	Dozen	Each	Dozen	
12	\$0.60	\$6.00	\$ 0.80	\$ 8.00	\$0.15
14	.85	8.50	1.05	10.50	.15
16	1.15	11.50	1.35	13.50	.15

STREET OR PUSH BROOMS

Rattan

Made of prime quality round rattan reed, fastened with staples. Five foot handles.

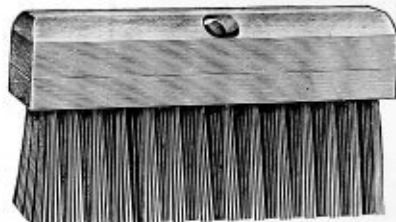


Prices Without Handles

Length Head, inches	4 Row		6 Row		Handles, Each Extra
	Each	Dozen	Each	Dozen	
12	\$0.40	\$4.00	\$0.50	\$5.00	\$0.15
14	.50	5.00	.60	6.00	.15
16	.60	6.00	.70	7.00	.15

STEEL WIRE PUSH BROOMS

Well made and substantial. Flat tempered steel wire 5 inches long. 52-inch hardwood handles.



Block, inches	Length Wires, inches	Sweep, inches	Each	Dozen
12	5	11	\$0.90	\$ 9.00
14	5	13	1.00	10.00
16	5	15	1.10	11.00

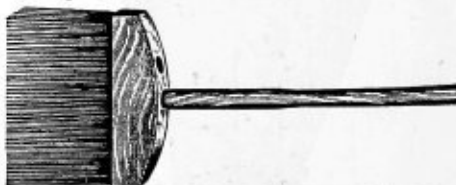
4 Rows, Wide; 5-inch Wires; Flaring Ends

12	5	15	\$1.10	\$11.00
14	5	17	1.20	12.00
16	5	19	1.30	13.00

CHILL OR FROG BROOMS

For Frogs and Switches

Made of steel wire. 5-inch projection placed so that sweeping is done endwise.



Length Block	4 Rows Wide, Price, Each	Handles, Each, Extra
12	\$0.80	\$0.15
14	.90	.15

STANDARD RAILROAD, CONTRACTORS AND MINING SHOVELS

"PLAIN BACK" OR "STRAPPED"

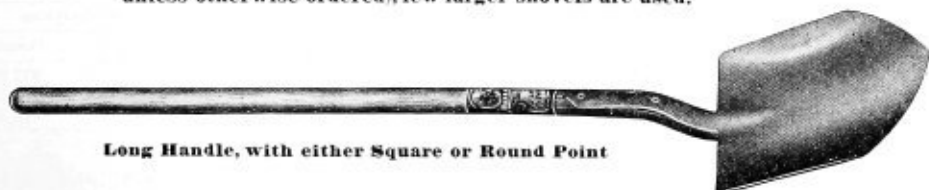
Our "**Bullock**" or extra grade shovels are made of the best crucible steel, finely finished, with best white ash handles; they will outlast any other make. They are adapted for very hardest service, such as crushed stone for concrete, ballast, etc.

Our "**Winfield**" or first grade shovels are also made of crucible steel, while the other grades are of open hearth steel, lighter in weight and have lower priced handles.

Our "**Helmer**" shovels are good, fourth grade shovels. While they are not strong enough for railroads or contractors, they will give better service in general shoveling and last longer than any fourth grade shovel made.



No. 2 Regular Shovel, with square point and wooden "D" handle, black finish (always sent unless otherwise ordered), few larger shovels are used.



Long Handle, with either Square or Round Point



Malleable Railroad Iron, "D" Tamping Handle

Size	SIZE BLADE, INCHES		"BULLOCK"		"WINFIELD"		"VAN KLEECK"		"GOODMAN"		"HELMER"	
	Width	Length	Each	Dozen	Each	Dozen	Each	Dozen	Each	Dozen	Each	Dozen
2	9½	11¾	\$1.65	\$16.50	\$1.45	\$14.50	\$1.20	\$12.00	\$0.95	\$9.50	\$0.85	\$8.50
3	9¾	12¼	1.70	17.00	1.50	15.00						
4	10½	12½	1.75	17.50	1.55	15.50						

"Bullock," "Winfield" and "Helmer" grades only are carried in Chicago stock; other grades shipped promptly from factory.

Above prices are for black finish; for polished add 50 cents per dozen.

Shovels with square or round points, "D" or long handles, are all the same price.

SEWER OR BRICK SHOVELS

MADE IN No. 2 SIZE ONLY



Has a shorter and heavier blade than No. 2 above shown for clay and other heavy material.

	Each	Dozen		Each	Dozen
"Bullock".....	\$1.85	\$18.50	"Salamonie".....	\$1.20	\$12.00

MOULDERS' SHOVELS

Strong, Light and Perfectly Balanced, Full Polished or Blued. Made in No. 2 Size Only. Flat Blade



Regular "D" Handle



Split "D" Handle

These shovels are made in No. 2 size only, and of the very best material obtainable. The finish and quality are unsurpassed. They are used by the largest foundries in the country.

Number	Quality	PRICES—POLISHED	
		Each	Dozen
2	"Bullock".....	\$1.70	\$17.00
2	"Winfield".....	1.50	15.00
2	"Van Kleeck".....	1.25	12.50

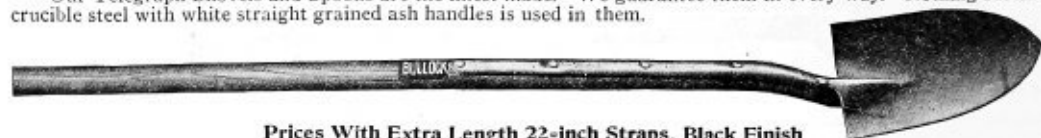
"BULLOCK" CONCRETE SHOVELS

Made same as "D" handle molders' shovel, but with straighter, heavier and stiffer blades, polished. Used for finishing concrete in sidewalks, in forms, etc. Price, each..... \$1.90 Price, per dozen... \$19.00

TELEGRAPH SHOVELS AND SPOONS

Made in One Size Only, But With Different Length Handles

Our Telegraph Shovels and Spoons are the finest made. We guarantee them in every way. Nothing but fine crucible steel with white straight grained ash handles is used in them.



Prices With Extra Length 22-inch Straps, Black Finish

Length of Handles	"BULLOCK"		"WINFIELD"	
	Each	Dozen	Each	Dozen
6	\$2.35	\$23.50	\$2.05	\$20.50
7	2.55	25.50	2.25	22.50
8	2.75	27.50	2.45	24.50
9	3.15	31.50	2.85	28.50
10	3.55	35.50	3.25	32.50

Ninety per cent of all Telegraph Shovels sold have 8-foot handles. We stock both seven and eight; other lengths shipped promptly from factory. For shovels with 9-inch straps deduct \$2.00 per dozen from list prices.

TELEGRAPH SPOONS

We only stock spoons with seven and eight foot handles. For spoons with 22-inch straps add \$2.00 per dozen to list below.

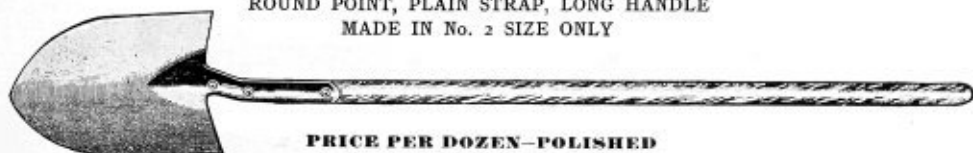


Prices With Regular 9-inch Straps, Black Finish

Length of Handles	"BULLOCK"		"WINFIELD"	
	Each	Dozen	Each	Dozen
6	\$2.30	\$23.00	\$2.00	\$20.00
7	2.50	25.00	2.20	22.00
8	2.70	27.00	2.40	24.00
9	3.10	31.00	2.80	28.00
10	3.50	35.00	3.20	32.00

PLAIN BLACK WESTERN MINING SHOVELS

ROUND POINT, PLAIN STRAP, LONG HANDLE
MADE IN No. 2 SIZE ONLY

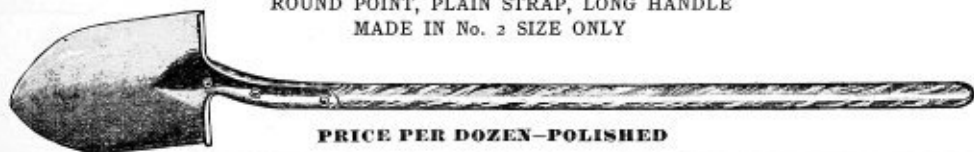


PRICE PER DOZEN—POLISHED

Style of Point	"Bullock"		"Winfield"	
	Each	Dozen	Each	Dozen
Stiff Point.....	\$1.70	\$17.00	\$1.50	\$15.00
Half Spring.....	1.70	17.00	1.50	15.00
Full Spring.....	1.70	17.00	1.50	15.00

PLAIN BLACK IRRIGATING SHOVELS, WITH STEP

ROUND POINT, PLAIN STRAP, LONG HANDLE
MADE IN No. 2 SIZE ONLY



PRICE PER DOZEN—POLISHED

Size	"Bullock"		"Winfield"	
	Each	Dozen	Each	Dozen
No. 2.....	\$1.90	\$19.00	\$1.70	\$17.00

Should Black Shovels like the above be wanted, deduct 50c per dozen from the list prices.

SPADES

PLAIN BACK, PLAIN STRAP, POLISHED.



"D" Handle.



Long Handle.

Size	"Bullock"		"Helmer"	
	Each	Dozen	Each	Dozen
No. 2 only.....	\$1.70	\$17.00	\$0.90	\$9.00

DITCHING AND DRAIN SPADES

Plain Back—"D" Handle



Ditching Spade



Drain Spade

PRICES—(Polished only carried in Stock)

Length of Blade	"BULLOCK"		"GOODMAN"	
	Each	Dozen	Each	Dozen
14 inches.....	\$2.10	\$21.00	\$1.40	\$14.00
16 ".....	2.15	21.50	1.45	14.50
18 ".....	2.20	22.00	1.50	15.00
20 ".....	2.25	22.50		

Ditching and Drain Spades take same list prices.

SKELETON DITCHING AND DRAIN SPADES

Solid Cast Steel. Solid Sockets



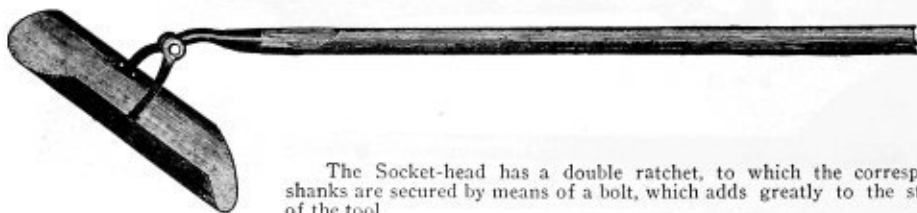
Ditching Spade

Especially adapted for mucky and sticky soil; they have extending footsteps; back of prongs is diamond shaped and prongs are extra braced in center for stiffening.

	Style Point	Size, inches	"BULLOCK"	
			Each	Dozen
Ditching Spades.....	Square	6½ x 18	\$3.80	\$38.00
Drain Spades.....	Round	4½ x 18	3.60	36.00

"CHAMPION" DRAIN CLEANERS

For finishing Tile Ditches. Concave and Adjustable to any angle, made to push or pull, with 6½ foot handles



The Socket-head has a double ratchet, to which the corresponding shanks are secured by means of a bolt, which adds greatly to the strength of the tool.

SIZE OF BLADE, INCHES		Price, Each	Price, per Dozen
Length	Width		
15	4	\$1.80	\$18.00
15	5	1.85	18.50
15	6	1.90	19.00

HOLLOW-BACK SHOVELS

Chisholm Pattern

**"D" Handle Square Point****"D" Handle, Round Point****Long Handle, with Either Square or Round Point****PRICES—Black Finish**

No.	DIMENSIONS		"BOUGHTON"		"Kongo"	
	Width	Length	Each	Dozen	Each	Dozen
2	9½	11¾	\$1.35	\$13.50	\$0.75	\$7.50
3	9¾	12¼	1.40	14.00		
4	10½	12½	1.45	14.50		

We make all the above numbers with either square or round point and with regular "D" or long handle, and use the same list of prices for all.

The blade and strap of a hollow back shovel are pressed out of a single piece of steel. There are no welds. It costs less to manufacture hollow back shovels, therefore they are lower in price, but for general use they are not so serviceable. There are large quantities made and sold.

We always send black shovels unless polished is specially ordered. For polishing add 50c per dozen to the above list prices. Spades and shovels take the same list prices.

HOLLOW-BACK "D" HANDLE SPADES

Sizes Nos. 2 and 3 Only

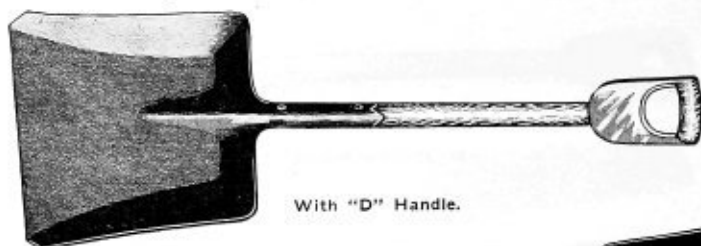


No.	DIMENSIONS		"BOUGHTON"		"Kongo"	
	Width	Length	Each	Dozen	Each	Dozen
2	7½ x 7½	12	\$1.40	\$14.00	\$0.80	\$8.00
3	8 x 7½	12¼	1.45	14.50		

Polished spades always furnished unless otherwise ordered.

HOLLOW-BACK COAL AND COKE SHOVELS

SQUARE POINT, "D" OR LONG HANDLE



With "D" Handle.



With Long Handle.

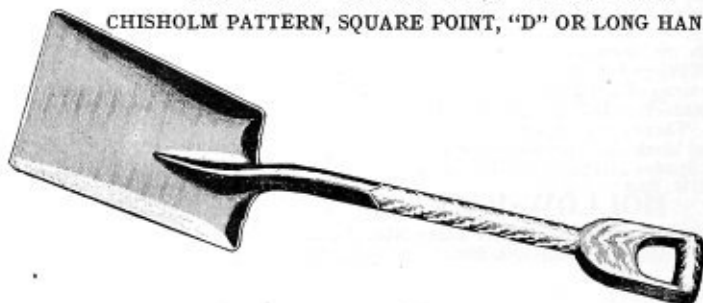
PRICES—BLACK FINISH

No.	Size		"Boughton"		"Kongo"	
	Width	Length	Each	Dozen	Each	Dozen
1 Coal.....	13½	14	\$1.40	\$14.00	.80	\$8.00
2 ".....	14¼	14½	1.45	14.50	.85	8.50
3 ".....	14¾	15	1.50	15.00	....	....

Black finish always furnished unless otherwise ordered.
For polished, add 50 cents to list prices on black finished.

HOLLOW-BACK ORE SHOVELS

CHISHOLM PATTERN, SQUARE POINT, "D" OR LONG HANDLE

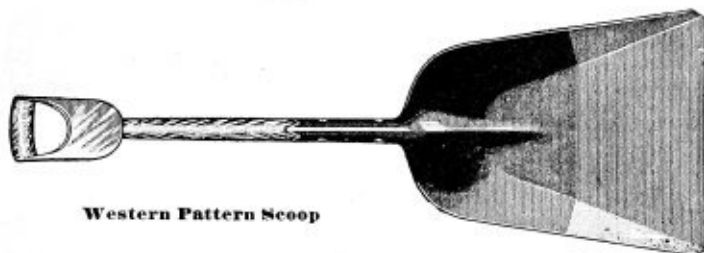


PRICES—BLACK FINISH

No.	Size		"Boughton"		"Boleo"	
	Width	Length	Each	Dozen	Each	Dozen
No. 4.....	11	12¾	\$1.45	\$14.50	\$1.20	\$12.00
" 5.....	11¼	13¾	1.50	15.00	1.25	12.50

For list on Polished, add 50c per dozen to list on Black.

HOLLOW-BACK SCOOPS



Western Pattern Scoop

PRICES

Eastern Pattern (or narrow mouth) Locomotive and Coal Scoops and Western Pattern (or wide mouth) Grain Scoops all take the same list.

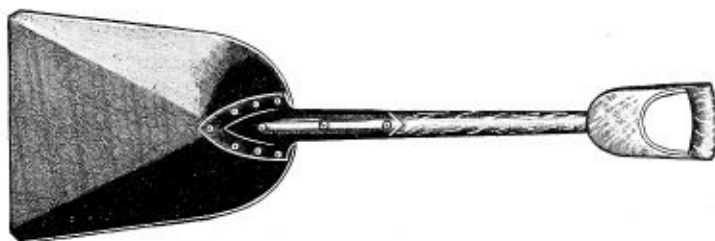
Size No.	"BOUGHTON"		KONGO		"Eastern Pattern," Width and Length	"Western Pattern," Width and Length
	Per Dozen	Each	Per Dozen	Each		
2	\$14.00	\$1.40	\$ 8.00	\$.80	11 x15	.....
3	14.50	1.45	8.50	.85	11½x15½	.....
4	15.00	1.50	9.00	.90	11½x16	12½x15½
5	15.50	1.55	9.50	.95	12 x16½	13½x16
6	16.00	1.60	10.00	1.00	12¾x17	13½x16½
7	16.50	1.65	10.50	1.05	13¼x17	13¾x17
8	17.00	1.70	11.00	1.10	13¾x17¼	14½x17½
9	17.50	1.75	11.50	1.15	.....	14¼x18
10	18.00	1.80	12.00	1.20	.....	14½x18¾
12	19.00	1.90	13.00	1.30	.....	15 x19¾

The Locomotive Scoops have shorter handles than the regular coal scoops. We do not make the Eastern Pattern Scoops larger than No. 8, nor the Western Pattern smaller than No. 4.

For list on Half Polished, add 30c per dozen to list on Black. For list on Full Polished, add 50c per dozen to list on Black. Grain scoops are always polished.

BACK STRAP SCOOPS

LOCOMOTIVE AND COAL SCOOPS FURNISHED WITH EITHER "D" OR LONG HANDLE



Size No.	SIZE		"WINFIELD"	
	Width	Length	Per Dozen	Each
3	11¼	15½	\$19.00	\$1.90
4	11½	16	19.50	1.95
5	12	16½	20.00	2.00
6	13	17	20.50	2.05
7	13¼	17¾	21.00	2.10
8	13½	18	21.50	2.15
7 Reinforced	13¾	17¾	25.00	2.50

For list on Polished Scoops, add 50c per dozen to list on Black.

H.Channon Company. Chicago.

"AMES" COAL SCOOPS

Back Strapped



Cut Shows No. 7 Reinforced

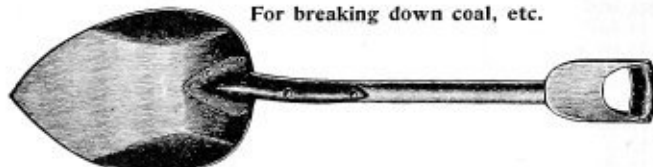
PRICES—O. "AMES" BEST QUALITY—BLACK FINISH

Size	Width	Length	Each	Dozen
No. 3.....	11½	15½	\$1.30	\$13.25
No. 4.....	12	16	1.35	13.75
No. 5.....	12½	16½	1.40	14.00
No. 6.....	13¼	17	1.45	14.50
No. 7.....	13¾	17	1.50	15.00
No. 8.....	14	17¾	1.55	15.50
No. 7 Reinforced.....	13¾	17	1.60	16.00

For polished scoops add 50 cents per doz. to above list.

"AMES" V POINTED SCOOPS

For breaking down coal, etc.



PRICES—BLACK FINISH

Size	Price Each	Price per Dozen
No. 8 only	\$1.65	\$16.50

"REEDS" D HANDLE TRIMMER OR BAG SCOOP

O. "Ames" Manufacture—very light in weight



Size	Width at Mouth	Length	Each	Dozen
No. 3	15½ inches	11 inches	\$0.90	\$9.00

"AMES" SHOVELS

Plain Back



No.	Style Point	Size	BLACK		POLISHED	
			Each	Dozen	Each	Dozen
2	Square	9¾ x 11¾	\$1.20	\$12.25	\$1.30	\$13.00
2	Round	9¾ x 12¾	1.30	13.00	1.35	13.50

"AMES" SEWER OR BRICK SHOVELS

No. 2. Black shorter and heavier than above shovels.....\$13.50 dozen
 The "Ames" Shovels and Scoops are listed low but the discount from list given is very small.

FURNACE SCOOPS

HOLLOW-BACK



Kongo Brand.

A good strong scoop, made of 16 gauge steel, 9 inches wide, 14 inches long and weighs 5¼ pounds each. Made with regular wood "D" handles or wood and iron D handle (as per cut).

Style	Price Each	Price Doz.
With Wood and Iron D Handles.....	\$0.80	\$2.00
With Wood D Handle.....	.90	9.00

SNOW SHOVELS

HOLLOW-BACK



With Wood and Iron "D" Handles.



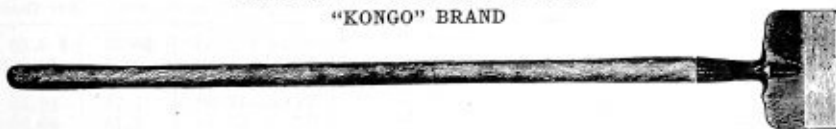
With Long Handles.

"KONGO" BRAND

Style	Size, Blade	Price, Each	Price, Dozen
With Wood and Iron D (as per cut).....	11½x14 inches	75	\$7.50
With Long Handles.....	11½x14 "	60	6.00
With Regular Wood D Handles.....	11½x14 "	90	9.00

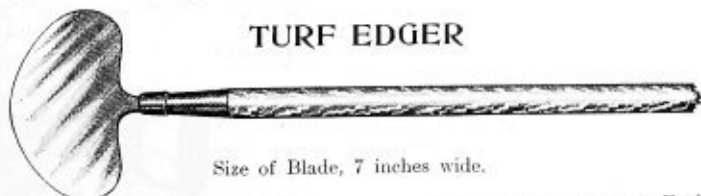
SIDEWALK SCRAPERS

"KONGO" BRAND



Pressed out of one piece of steel, 4½-foot handle, 7-inch blade.....Each, 50c. Dozen, \$5.00

TURF EDGER



Size of Blade, 7 inches wide.

4½-foot handle.....Each, 45c. Dozen, \$4.50

H.Channon Company.Chicago.

HANDLES, WHITE ASH

"D" Shovel, Spade and Scoop Handles



PRICES

Style	XX		X	
	Per Dozen	Each	Per Dozen	Each
Shovel, bent and riveted.....	\$4.25	\$0.45	\$3.50	\$0.35
Spade, bent and riveted.....	4.10	.40	3.35	.35
Scoop, bent and riveted.....	4.25	.45	3.50	.35
Ditching Spade, bent and riveted.....	5.00	.50	4.00	.40
Shovel or Spade, straight, riveted.....	4.10	.40	3.35	.35
Shovel, straight, Maynard Pattern.....	4.10	.40	3.35	.35

XX only in stock

Long Shovel, Spade and Scoop Handles



PRICES

Style	XX		X	
	Per Dozen	Each	Per Dozen	Each
4½-foot Shovel, bent.....	\$4.00	\$0.40	\$3.00	\$0.30
4½-foot Spade, bent.....	3.50	.35	2.50	.25
4½-foot Scoop, bent.....	4.00	.40	3.00	.30
4½-foot Shovel, straight, Maynard Pattern.....	3.50	.35	2.50	.25

XX only in stock

Telegraph Shovel and Spoon Handles



PRICES

Length	SHOVEL HANDLES				SPOON HANDLES			
	XX		X		XX		X	
	Per Dozen	Each	Per Dozen	Each	Per Dozen	Each	Per Dozen	Each
6-foot.....	\$ 8.50	\$0.85	\$ 7.75	\$0.80	\$ 9.50	\$0.95	\$ 8.50	\$0.85
7-foot.....	10.50	1.05	9.75	1.00	11.50	1.15	10.50	1.05
8-foot.....	12.50	1.25	11.75	1.20	13.50	1.35	12.50	1.25
9-foot.....	16.50	1.65	15.50	1.55	17.50	1.75	16.50	1.65
10-foot.....	20.50	2.05	19.00	1.90	21.50	2.15	20.50	2.05

We carry 8-foot XX handles only in stock

MALLEABLE "D'S"

For Shovel or Fork Handles

PRICES

Style	Per Dozen	Each
Wood head, malleable fork and socket.....	\$2.00	\$0.20
All iron, for railroad tamping.....	3.00	0.30



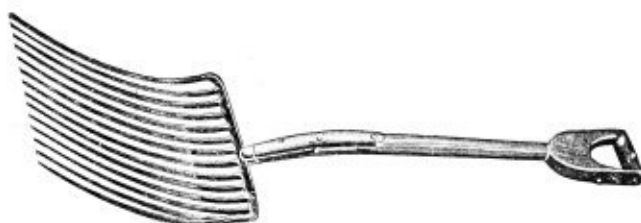
Wood Head



Iron Head

COAL AND COKE FORKS

BULLOCK BRAND. DIAMOND SHAPED TINES, CAREFULLY OIL TEMPERED



Our Bullock Brand Coal and Coke Forks are forged from one solid piece of steel for the tines, head and shank. Tines are diamond shaped and carefully oil tempered. Wide strap ferrules and heavy caps are used; strong, selected, 30-inch wood D or malleable D handles furnished as ordered.

Measure width of forks across center, not across points of the tines.

BULLOCK BRAND COAL FORKS

No.	Number of Tines	Length of Tines, inches	Width of Fork, inches	Distance Between Tines, inches	Weight per Dozen, pounds	PRICES	
						Each	Per Dozen
812	12	16	14½	7⁄8 to 1	95	\$2.00	\$29.00
814	14	16	16	7⁄8 to 1	108	2.30	33.00
816	16	16	18	7⁄8 to 1	120	4.00	40.00

BULLOCK BRAND COKE FORKS

No.	Number of Tines	Length of Tines, inches	Width of Fork, inches	Distance Between Tines, inches	Weight per Dozen, pounds	PRICES	
						Each	Per Dozen
710	10	17	14¼	1¼	88	\$2.40	\$24.00
712	12	17	17½	1¼	100	2.80	28.00
714	14	17	21¼	1¼	112	3.30	33.00
716	16	17	18	¾ to 7⁄8	120	4.00	40.00

BULLOCK BRAND STONE OR BALLAST FORKS

SQUARE TINES



A favorite with railroads and quarries for handling broken stone. The tines are made additionally strong and the fork is hung to accommodate heavy lifting. Natural finish; finely tempered; wide strap ferrules and heavy caps; wood D ash handles.

BULLOCK BRAND

No.	Number of Tines	Length of Tines, inches	Width of Fork, inches	Weight per Dozen, pounds	PRICES	
					Each	Per Dozen
98	8	13½	11¼	76	\$2.00	\$20.00
100	10	13½	14½	88	2.50	25.00
103	12	14½	13¾	96	2.90	29.00

HOP OR STONE HOOKS



No.	Style Tines	Handles	Price Each	Price Per Dozen
46	4 Diamond Backed, extra heavy	5 Foot	\$2.25	\$22.50
48	4 " " light	4½ "	1.70	17.00

ASPHALT OR TAR RAKES

Solid steel; drop shank; strap ferrules; five foot selected white ash handles and eighteen inch square iron shank.



No.	Number of Teeth	Length Shank, inches	Length Handle, feet	Price Each	Price per Dozen
59	14	18	5	\$2.85	\$28.50

TWO-MAN RAKE

This is a good road rake for contractors. Operated by two men and levels a load of broken stone in one-quarter the time it takes the old way.

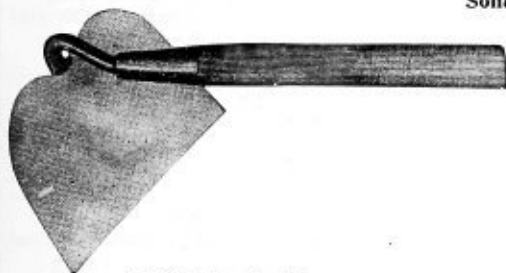
1½ inches between the teeth; Standard tooth is 6 inches long, but we can furnish any length required. One handle is removable and so adjusted that it will not come off when in use.



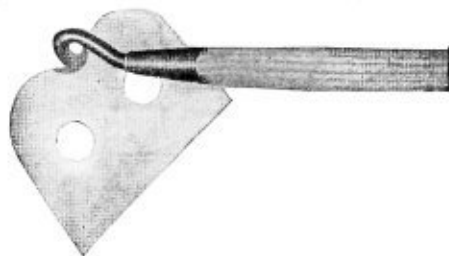
10 Tooth.....	each, \$3.18,	dozen, \$31.80
12 "	" 3.55,	" 35.00
14 "	" 3.90,	" 39.35

MORTAR HOES

Forged from Best Hoe Steel. 6 Foot Selected White Ash Handles.
Solid Shank



No. 60. Mortar Hoe



No. 61. Mortar Mixing Hoe with Two Holes

No.	Approximate Weight, per Dozen	Price Each	Price per Dozen
60	45 pounds	\$2.55	\$14.50
61	45 "	2.80	13.00

GARDEN OR FIELD HOES

Forged from Best Hoe Steel. 4½ Foot Selected White Ash Handles

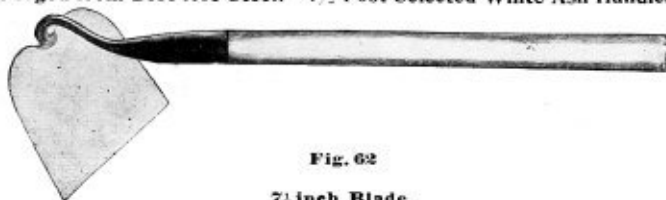


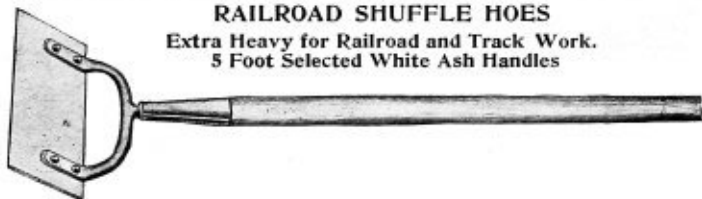
Fig. 62

7½ inch Blade

No.	Style	Approximate Weight, per Dozen	Price Each	Price per Dozen
62	Solid Socket	25 pounds	\$1.45	\$14.50
63	Solid Shank	25 pounds	1.30	13.00

RAILROAD SHUFFLE HOES

Extra Heavy for Railroad and Track Work.
5 Foot Selected White Ash Handles



No.	Style	Blade, inches	Approximate Weight, per Dozen	Price Each	Price per Dozen
64	Heavy Malleable Shank	4x8½	20 pounds	\$1.50	\$15.00

GARDEN SHUFFLE HOES

4½ Foot Selected White Ash Handles



No.	Blade, inches	Approximate Weight, per Dozen	Price Each	Price per Dozen
65	2½x9	20 pounds	\$1.20	\$12.00

PICKS AND MATTOCKS

RAILROAD OR CLAY PICKS

Adze Eye—Pick and Chisel Points—High Grade Solid Steel



With Tool Steel Points

The points of these picks are made of best quality crucible tool steel and will outwear two ordinary picks in rock or brick.

Weight, pounds	Price Each	Price per Dozen
7½	\$1.90	\$19.00
8½	2.00	20.50

Fig. 33 Standard Dirt Pick



Furnished in the 6 to 7-lb. size unless otherwise ordered.

Weight, pounds	Price Each	Price per Dozen
5 to 6	\$1.40	\$14.00
6 to 7	1.50	15.00
7 to 8	1.60	16.00
9 to 10	2.00	20.00

RAILROAD TAMPING PICKS

High Grade Solid Steel. V Head, Adze Eye



Fig. 35

Standard Size Tamp. Extra Strong Adze Eye

Weight, pounds	Price Each	Price per Dozen
6 to 7	\$1.80	\$18.00
8 to 9	2.00	20.00

DRIFTING PICKS

Adze Eye. Points of Best Grade Crucible Tool Steel



Fig. 38

Weight, pounds	Price Each	Price per Dozen
4½	\$1.50	\$15.00
6	1.75	17.50

SHORT EAR COAL PICKS

Cutting and Mining. Iron Eyes and Crucible Tool Steel Points



Fig. 46

Weight, pounds	Price Each	Price per Dozen
3½	\$1.00	\$10.00
4½	1.10	11.00

POLL PICKS

Adze Eye. Points of Best Grade Crucible Tool Steel



Fig. 39

Weight, pounds	Price Each	Price per Dozen
3½	\$1.00	\$10.00
4½	1.10	11.00

MATTOCKS

Adze Eye



Fig. 51 Long or Short Cutter

Style	Weight, pounds	Size Blade, inches	Size Cutter, inches	Price Each	Price per Dozen
Short Cutter.	5	3½ x 7½	2½ x 4¼	\$1.60	\$16.00
Long "	5½	3½ x 7½	2½ x 5¼	1.60	16.00

Pick Mattock. Fig. 52

Packed 2 doz. in a case. Polished and painted black.

Weight, pounds	Size Blade, inches	Size Cutter, inches	Price Each	Price per Dozen
5½	4½ x 8½	8½	\$1.70	\$17.00

SPECIAL ASPHALT MATTOCKS

With Crucible Tool Steel Cutter and Chisel Ends



Fig. 55

Weight, 9 lbs. each	\$3.50	Dozen	\$35.00
With double cutter, sometimes called asphalt axe, 8 lbs. each	\$2.40	Dozen	\$24.00



GRUB HOES

Adze Eye. Fig. 53

No.	Weight, pounds	Size, inches	Price Each	Price per Dozen
1	3½	3¼ x 10¼	\$1.30	\$13.00
2	4	4 x 11¼	1.35	13.50
3	4½	4¼ x 11½	1.40	14.00

SPECIAL CONTRACTORS' CAISSON GRUB HOES

Heavy pattern, weight 5 pounds, size 4¼ x 11½.	
Dozen	\$22.00
Extra heavy pattern for hard pan. Weight 8 pounds, size 3 x 12.	
Dozen	50.00

TOOL HANDLES

Extra Grade; second growth hickory with wax finish; absolutely clear and white and free from all imperfections.

Excelsior Grade; second growth ash with wax finish; clear and free from imperfections.

No. 1 Grade; second growth hickory; plain finish; small sound knots permitted, but otherwise free from blemish and strictly serviceable.

HAMMER HANDLES



Adze Eye Nail Hammer



Riveting Hammer



Machinist's Hammer

Length, inches	Grade	PRICE PER DOZEN			
		Adze Eye Nail	Riveting	Machinist's	Blacksmith
12	Extra	.....	\$1.60	.....	.....
14	"	\$1.70	1.60	\$1.00	.....
16	"	.....	.....	1.75	.....
18	"	.....	.....	2.00	\$2.00
20	"	.....	.....	.....	2.25

Packed 5 dozen in a case.

HATCHET HANDLES



Length, inches	Grade	PRICE PER DOZEN	
		Regular	Broad
14	Extra	\$1.70	.....
18	"	.....	\$2.25

Packed 5 dozen in a case.

HICKORY AXE HANDLES



Single Bitted



Double Bitted

Kind	Length, inches	PRICE PER DOZEN	
		Extra Grade	No. 1 Grade
Single Bitted.....	36	\$9.80	\$4.90
Boys' Single Bitted	28	6.80	3.90
Double Bitted....	36	9.80	4.90

Packed 2 dozen in a case.

RAILROAD PICK HANDLES



Length, inches	PRICE PER DOZEN		
	Extra Grade	Excelsior Grade	No. 1 Grade
36	\$11.50	\$8.00	\$6.00

Packed 5 dozen in a case.

MINING PICK HANDLES



Drifting and Coal Miners



Poll Pick

Kind	Length, inches	Price per Doz., Extra Grade
Drifting.....	24	\$9.80
Coal Miner's.....	34	7.90
Poll.....	34	9.80

Packed 5 dozen in a case.

SLEDGE, TOOL AND MAUL HANDLES



Length, inches	PRICE PER DOZEN	
	Extra Grade	No. 1 Grade
24	\$4.00	\$2.80
28	5.00	3.20
30	5.60	3.70
36	6.70	4.60

Packed 5 dozen in a case.

GRUB HOE HANDLES



Length, 36 inches; Extra Grade.....
Price per Doz. \$11.50

ADZE HANDLES

For Railroad, House Carpenter and Ship Adzes



Length, 34 inches; Extra Grade.....
Price per Doz. \$10.10

"MONARCH" FULL BOLTED WOODEN RAILROAD WHEELBARROWS

This is the best wooden barrow made. Full-sized bent, tray, planed, cleated and strapped together, and well finished, bolted securely to frame. The legs extend upward, serving as a brace to the bowl, to which they are bolted; they are also bolted to handles. Made of selected hardwood thoroughly air seasoned. Wheel revolves on a fixed axle bolt $\frac{1}{2}$ -inch diameter and runs true and evenly. Knocks down completely for shipping, and is easily set up. With heavy steel wheel $16\frac{1}{2}$ inches diameter, $\frac{3}{8}$ -inch round spokes, tire $1\frac{3}{8} \times \frac{3}{8}$ -inch. Weight 650 lbs. per dozen. Price each.....\$ 3.60
Price per dozen 36.00

No. 96—BOLTED WOODEN MORTAR BARROWS

All hardwood thoroughly air seasoned. The side and end pieces of tray being dovetailed together and firmly strapped and nailed, cannot come apart; edges of tray iron strapped. Handles are 5 feet long. Legs extend upward as a brace to the bowl and are bolted to both bowl and handles. Tight box for wheeling mortar; iron braced and well bolted. Box 10 inches deep at handles and 13 inches at wheel, bottom $19\frac{1}{2}$ inches square, top 27 inches wide by 29 inches long.

With steel wheels—weight 60 lbs. each.
Price, each\$ 5.10
Price, per dozen 51.00

No. 36—BENT HANDLE WOODEN STONE BARROWS

Bent handles. Thoroughly bolted. Well ironed. Handles, 6 feet long. Cross piece at legs, 2×3 inches. Bottom $1\frac{1}{4}$ inches thick by 26 inches wide by 27 inches long. Dash, 11 inches high. Wheel, 17 inches diameter; tire, $1\frac{3}{4} \times \frac{3}{8}$ inches; spokes, $1 \times 1\frac{1}{4}$ inches. Axle bolt, $\frac{5}{8}$ -inch. Painted dark red. Wheel, lead color. Weight, 72 lbs. Furnished with Patent Steel Spoke Wheel, when so ordered, $16\frac{1}{2}$ inches diameter; tire, $1\frac{3}{4} \times \frac{3}{8}$ inches.

Price each\$ 6.30
Price per dozen, with wood wheel..... 60.00

No. 97—FOLDING WOODEN BARROWS

With Removable Side Boards. Double Frames



Easily knocked down and quickly set up

These barrows are made of thoroughly seasoned wood, with double frames, firmly bolted together, iron braced, and so constructed that, by simply removing one bolt (the axle) and two nuts, they can be folded flat down, and shipped at lowest rate of freight. But a moment's time is required to set up for use. Painted green and varnished.

With Steel Wheels

Size, No.	Size of Bed, inches	Capacity, Cubic Feet	Length of Handle, inches	Wgt., Lbs.	Price, Each	Price, Dozen
3	12x22x25	4	52	52	\$4.20	\$42.00



Has Seamless, Side-Dumping "Pan" Tray for wheeling Concrete, Stone, Wet Dirt, etc. Capacity 4 cu. ft. Light and Strong. Weight 62½ lbs. each

Tray of No. 14 Gauge Steel, pressed from a single sheet, has no joints, seams or rivets. Edge of tray is turned over a $\frac{1}{8}$ steel rod, stiffening and strengthening it. Size of tray, greatest length 32 in., width 33 in., depth at wheel end 11 in., at handle end 7½ in., capacity—4 cubic feet. No. 13X Lewis Patent Steel Wheel 16½ in. diam., tire 1½x¾ in., steel spokes ¾ in. round. Weight, 62½ lbs. each.
Price, each\$5.00

THE IMPROVED "PAN-AMERICAN" STEEL TRAY WOOD FRAME BARROWS

This is the genuine Pan-American barrow with all latest improvements—angle-iron legs and braces and additional V-shaped brace extending from the handles at each side and bolted to the cross brace, securing a very strong and rigid under frame. Instead of the axle bolt running through the handles as before, we furnish bearing clips or boxes in which the wheel runs true.

Tray and frame painted red brown.

Price, per dozen\$55.00

"BULLOCK STEEL TRAY" WOOD FRAME BARROWS



An Excellent Barrow for Concrete Street Paving and General Use. Same as old style "Pan-American" with iron braced wooden legs.

Price, with Steel Wheels, each.....\$ 4.50
" " " " per dozen 45.00

The tray is made of best steel, pressed from a single sheet, without joint, seam or rivet, with flange turned over a $\frac{1}{8}$ steel rod, which passes entirely around the tray, preventing breaking, and stiffening and strengthening it.

Dimensions

Greatest length of tray32 inches
" width "33 "
Depth at Wheel End11 "
" Handle "7½ "

The wheels run true and evenly. The tires will not come off nor the spokes become loose.

No. 2B "COLUMBUS" CONTRACTORS' BARROW

Capacity—2 cu. ft. of dry concrete; 4 cu. ft. of dirt.
Seamless Pressed Steel Tray. Angle-Iron Legs and Braces. Extension Handles with Steel Shoes for dumping either forward or sideways.
Weight, 74 lbs. Price, each.....\$8.00



16½ in. diam. Steel Wheel, Hub length 6 in., Tire 1½ x ¾ in.

This barrow is largely used in street work. The construction places the tray almost level when in carrying position and is thus capable of containing a load of semi-liquid material nearly equal to the level capacity of the tray.

The tray elevation also admits of placing the wheel further back under the tray and more directly under the load. The increased leverage thus gained makes the barrow easy to handle.

THE "K & J" CONCRETE AND MORTAR BARROW

Capacity—

2 cu. ft. mortar or concrete.

4 cu. ft. of dirt.

Deep tray formed from one sheet of steel bent up and riveted; a steel rod is beaded around edges. Angle iron legs, braces and wheel guard for dumping; wheel is directly under the load, making barrow easy to handle. Wheel $16\frac{1}{2}$ inches diameter, Tire $1\frac{1}{2}$ x $\frac{3}{8}$ inches. Weight, 73 lbs.

Price, each\$10.00



For Wet Concrete or Mortar

"COLUMBUS" IMPROVED STEEL TRAY WOOD FRAME WHEEL BARROWS



Iron Work Painted Black; Frame Brown

These barrows, while much lighter than those having iron frames, are equally strong for all practical purposes and will stand the roughest usage.

The trays are stamped from a solid plate of steel, of great hardness, and without seam or rivet.

The flange of tray is turned over a $\frac{1}{8}$ steel rod, which passes entirely around tray, giving a smooth finish to the edge of bowl, preventing breaking, and stiffening and strengthening.

The frame is strongly made of seasoned hardwood lumber and well finished.

The No. 1 size is used for earth, sand, ore and cinders. The No. 2 size for coal, ashes, etc. The No. 3 size for coal and coke, and has a capacity of 400 to 450 lbs. of coal, or 5 bushels of coke or charcoal, and about 6 cubic feet of earth.

Now furnished with Angle Iron Legs and Braces and additional V shaped Braces, extending from the handles at each side and bolted to the Cross Brace; securing a very strong and rigid underframe.

Wheel axle turns in two Malleable Iron Axle Clips or Bearings.

The tray is shaped so as to permit of both side and forward dumping.

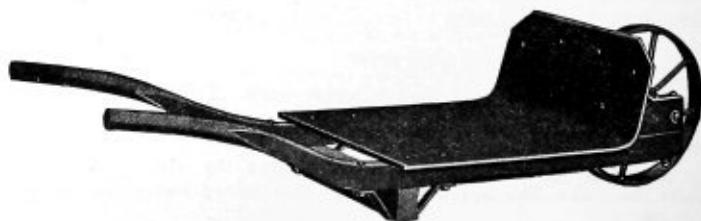
Price List with $16\frac{1}{2}$ Inch Diameter Steel Wheels Having $1\frac{1}{2}$ x $\frac{3}{8}$ Tires

No.	Capacity, Cubic Feet	Length on Top, inches	Width on Top, inches	Depth at Wheel, inches	Depth at Handle, inches	Greatest Length, inches	Greatest Height, inches	Weight Each, lbs.	Price Each
2	4	35½	28½	8½	6	65	20½	60	\$7.00
3	6	41½	33	11½	8	65	24	79	9.00

No. 37 STEEL BOTTOM STONE BARROWS

For stone or pig metal. One of the strongest and best stone barrows manufactured. Bottom and dash formed of one plate of steel, $\frac{1}{4}$ inch thick, 26 inches wide by 27 inches long. Dash, 9 inches high. Handles, 2x3 inches, 6 feet long. Patent round spoke steel wheel, $16\frac{1}{2}$ inches diameter; tire, $1\frac{1}{2}$ x $\frac{3}{8}$ inches, painted black. Axle bolt, $\frac{3}{8}$ -inch. Weight, 100 lbs.

Price, each\$8.50



No. 2-A COLUMBUS STEEL TRAY WHEELBARROWS



A general purpose barrow with angle iron legs and braces, handles extended to form rest for end dumping. Trays are of heavy steel, turned over a $\frac{3}{8}$ inch rod. Extra Heavy Lewis pattern, round spoke wheels $16\frac{1}{2}$ inches diameter, tire $1\frac{3}{8} \times \frac{3}{8}$ inches. Spokes have heavy shoulder resting on inner side of rim, making a firmly braced and exceptionally strong wheel.

Table of Dimensions, Capacity and Weight

Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Length	Greatest Height	Capacity Cu. Ft.	APPROX. WEIGHT	
							Each	Doz.
$35\frac{1}{2}$ in.	$28\frac{1}{2}$ in.	$8\frac{1}{2}$ in.	6 in.	65 in.	$20\frac{1}{2}$ in.	4	58 lbs.	696 lbs.

Price each \$ 0.00
 Price per doz 90.00

COLUMBUS EXTRA HEAVY TUBULAR STEEL WHEELBARROWS



No. 9X



No. 17

Extra heavy, all steel mining and smelter barrow for the hardest service. Trays stamped from 10 gauge plate with rolled edges, heavily braced. Handles are one inch pipe extending around wheel to form wheel guard. Legs and braces are extra heavy; has a special wheel $16\frac{1}{2}$ inches in diameter, tire $\frac{1}{2} \times 1\frac{3}{4}$ inches, nine spokes 2 inches round, hub cast around spokes.

Table of Dimensions, Capacity and Weight

No.	Gauge	DIMENSIONS, TRAY, INCHES			Greatest Height	Capacity Cu. Ft.	Approx. Weight, Each	Approx. Weight, Doz.	Price Each
		Top	Depth at Wheel	Depth at Handle					
9x	10	$35\frac{1}{2} \times 28\frac{1}{2}$	$8\frac{1}{2}$	6	$21\frac{1}{2}$	4	126	1512	\$35.00
17	10	$41\frac{1}{2} \times 33$	$11\frac{1}{2}$	8	$25\frac{1}{2}$	6	151	1812	45.00

"COLUMBUS" TUBULAR STEEL BARROWS

Seamless Pressed Steel Trays and with Wheel Guards



The tubular iron forming the handles passes around in front and protects the wheel, answering as a rest upon which to tip the barrow when it is desired to dump forward or over the wheel. This piping is not pierced at any point by bolt or rivet. The trays are of the most approved shape and pressed from a solid plate of steel, without seam or rivet; the flange of the tray is turned over a 5-16 steel rod which passes entirely around the tray, giving a smooth finish to the edge of the bowl, preventing breaking, and stiffening and strengthening it. The steel wheels furnished are strong and substantial; they revolve on a fixed shaft, or axle bolt and run true and evenly, the axle shaft serving as a brace to the handles.

DIRT BARROWS

Intended for moving earth, sand, gravel, mortar, etc.

No.	Gauge of Steel in Tray	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Height	Cubic Capacity	Weight	Price Each
4	15 gauge	32 in.	29 in.	7 in.	5 in.	19½ in.	3 ft.	70 lbs.	\$10.75
4½	14 "	32 "	29 "	7 "	5 "	19½ "	3 "	75 "	11.50
5	14 "	35½ "	28½ "	8½ "	6 "	21½ "	4 "	78 "	13.50

FOUNDRY, MINING AND GENERAL PURPOSE BARROWS

These barrows have extra heavy leg braces and are intended for harder usage than Nos. 4 to 5 listed above. Nos. 8 and 9 are foundry barrows for wheeling castings, hot iron, etc., and for general foundry and furnace use.

No.	Gauge of Steel in Tray	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Height	Cubic Capacity	Weight	Price Each
6	14 gauge	32 in.	29 in.	7 in.	5 in.	19½ in.	3 ft.	83 lbs.	\$12.25
7	14 "	35½ "	28½ "	8½ "	6 "	21½ "	4 "	88 "	14.25
8	12 "	32 "	29 "	7 "	5 "	19½ "	3 "	95 "	14.00
9	12 "	35½ "	28½ "	8½ "	6 "	21½ "	4 "	98 "	16.00

COAL AND COKE BARROWS

No. 7 Barrow, capacity, 215 to 250 pounds of coal.

No. 10 Barrow, capacity, 400 to 450 pounds of coal.

No. 12 Barrow, capacity, 5 bushels coke or charcoal.

No. 12 Barrow is intended for carrying coke, charcoal, or other light material, and is not intended for use as a coal barrow.

No.	Gauge of Steel in Tray	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Height	Cubic Capacity	Weight	Price Each
7	14 gauge	35½ in.	28½ in.	8½ in.	6 in.	21½ in.	4 ft.	88 lbs.	\$14.25
10	13 "	41½ "	33 "	11½ "	8 "	25½ "	6 "	109 "	20.00
12	15 "	41½ "	33 "	11½ "	8 "	25½ "	6 "	93 "	18.50

Greatest length of all barrows listed is 67½ inches. Greatest width of all barrows is width on top of tray.

LOCOMOTIVE COALING BARROWS

Capacity, 38 Cubic Feet or 1 Ton



Coal Box: Of steel, 9 ft. long, 30 in. wide, 30 in. deep. Bottom of No. 10, sides of No. 12 steel. Top, bottom and ends re-inforced with $1\frac{1}{2} \times \frac{1}{4}$ in. angles.

Handles: 2 in. square steel with 4 in. drops.

Wheels: "Bettendorf" metal, roller bearing, 44 in. diam. $3 \times \frac{7}{8}$ in. tires, 14 cold drawn steel rollers $\frac{1}{2} \times 4$ in. in each bearing. Ball bearing caster wheel $8 \times 1\frac{1}{2}$ in.

Weight: 810 pounds.

Capacity: 38 cubic feet or one ton.

Price, each\$115.00

STEEL CHARGING BARROWS

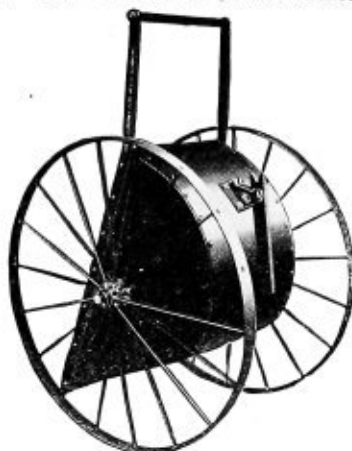


Designed for handling iron ore, limestone or coal and coke in filling or charging blast furnaces, but is now frequently used in gas works, in boiler-rooms, on coal docks, in brick yards, etc. Has anti-friction steel ball bearings. One man can easily handle it when loaded to its fullest capacity. It is easy to push, easy to dump. Diameter of wheel, 34 inches with tire 2 inches wide and 1 inch thick. Dimensions of box, greatest length, 40 inches; greatest width, 25 inches; greatest height, 24 inches. Capacity, 10 cubic feet, 1,500 lbs. iron ore; 500 lbs. coal. Weight complete, 630 lbs.

Price, each\$75.00

STIRLING CONCRETE CART

Capacity, 6 Cubic Feet (water measure)



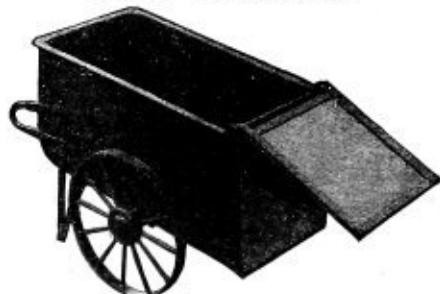
Dumping Position

One man can push or pull this cart over a runway even when cart is level full of concrete. A mixer can also be discharged in much less time than into a wheelbarrow.

Bottom and ends formed from one sheet of No. 12 steel, reinforcing axle plates 5x5, top angles $1\frac{1}{4} \times \frac{1}{4}$ " extending beyond bowl 18 inches to form handles. Wheels 40" in diam. Tires $1\frac{1}{4} \times \frac{1}{2}$ ". Axle $1\frac{1}{4}$ " square. Weight 270 lbs.

Price, each\$35.00

STEEL COKE BUGGY



For Steel Plants and Blast Furnaces

Capacity, 31 cubic feet; 800 lbs. coke. The door, or end-gate, is hinged at top, and is locked or released, by turning the unlocking-rod extending under bottom and conveniently arranged to operate by man holding buggy at handles. Size: length on bottom, 63 inches; on top, 57 inches; width, 30 inches; depth, 30 inches. Steel plate $\frac{3}{8}$ inches thick. Steel corner angles, $2 \times 2 \times \frac{3}{4}$ inches. Top angles $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$ inches. Heavy steel door bands. Wheels, diameter, 34 inches; tire, $2\frac{1}{2} \times \frac{3}{4}$ inches; 12 wrought spokes, $\frac{3}{8}$ -inch round; cast hub; jam-nuts inside of tire; steel axle, 2 inches square by 3 feet $4\frac{1}{4}$ inches long over all. Steel legs, $1\frac{1}{4} \times \frac{1}{2}$ inches, with brace $1\frac{1}{2} \times \frac{1}{2}$ inches. Weight, 975 lbs.

Price, each\$150.00

STANDARD SPRING BRICK TRUCK

No. 254. With Improved Staggered Wrought Spoke Wheels

For green pressed brick, common brick in moulds, tile, etc.

Platform: 18x63 inches inside measurement.

Ends: 22 inches long extending 2½ inches above slats.

Slats: 1½ inches wide by 1½ inches deep.

Height of platform at leg: 25 inches.

Height of platform at front: 27 inches.

Handle: Extends 25 inches in front of rack.

Length over all: 90 inches.

Wheels: 24 inches diam., with improved staggered spoke.

Tire: 1¼x½-inch extra wrought.

Axle: 1½-inch square steel with cast sand collar inside and sand cap outside of wheel, 29¼ in. outside width.

Leg: Steel shod-springs 1½x¼x28 inches long. Braces: ½-inch round steel.

Weight, 160 lbs. Each \$25.00



BRICK BARROWS

With Tight or Open Bottoms



For brick and tile yards and especially for handling green brick.

No. 114

Tight Bottom Wooden Wheel

Handles: 52 in. long. Dash: 24 in. wide, 19½ in. high.

Legs: 17 in. high. Wheel: 19 in. diam., 1¼x½ in. tire.

Bottom: 23½ in. wide. Spokes: 1x¼ in. Axle bolt: ¾ in.

Painted dark red, wheel blacked. Folds for shipping same as garden barrow. Weight 62 lbs. Also made with long iron brace from foot of leg to wheel end of handle if so ordered at slight advance in price.

No.	Style of Barrow	Style of Wheel	PRICE	
			Each	Dozen
113	Open bottom ..	Wood	\$5.50	\$55.00
113	" " ..	Steel	5 70	57.00
114	Tight bottom ..	Wood	5.80	58.00
*114	" " ..	Steel	6.00	60.00

*No. 114, with steel wheel, carried in stock; other sizes can be shipped promptly from factory at Columbus, O.

No. 117 SPRING TILE OR BRICK BARROW

Made of hard wood with strong two-leaved spring, patent steel wheel. Painted venetian red.

Platform or rack: 24x40 inches.

Spring: 1½x¼x28 inches.

Wheel: 16½ inches diameter.

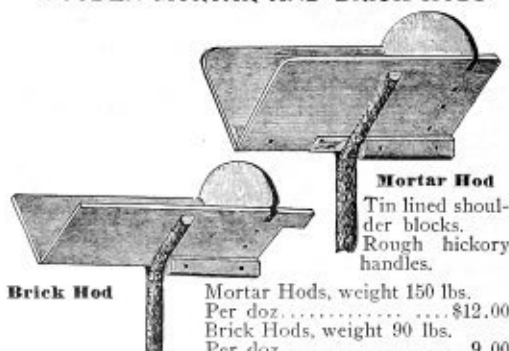
Tire: 1½x¾ inches.

Weight: 74 lbs.

Price.....Each \$7.00 Price.....Dozen \$70.00



WOODEN MORTAR AND BRICK HODS



Mortar Hod

Tin lined shoulder blocks.
Rough hickory handles.

Mortar Hods, weight 150 lbs.
Per doz. \$12.00
Brick Hods, weight 90 lbs.
Per doz. 9.00

STEEL MORTAR AND BRICK HODS

Strongly reinforced on edges and at dumping point. No. 162 size: 23x7x10 inches. Weight with handle about 8 lbs.



Mortar Hod No. 158



Brick Hod No. 162

Extra strong and durable.
Double reinforced.

No. 158 size: 24x11¼x12 inches. Weight with handle, about 11 lbs.

No. 158. Mortar Hod..Doz. \$18.00
No. 162. Brick Hod....Doz. 14.00

RAILROAD TRUCKS

Western Pattern



No. 4



No. 4X



No. 4XX

Best selected second growth hickory, oak or ash, turned steel axles, steel nose and side straps. Iron on cross bars extends through to outside of handles, bolts passing through irons, tenons and handles. Axles and collars forged from one piece and all steel parts heavy and most substantial.

No.	Length Handle, inches	Width, inches	Diameter Wheel, inches	Weight, pounds	Price Each	Extra for Rubbered Wheels
4	60	24	10 3/4	120	\$20.00	\$16.00
*4X	60	24	10 3/4	126	22.00	16.00
†4XX	60	24	10 3/4	137	28.00	19.00

*No. 4X has one center strap welded to nose.

†No. 4XX has two center straps welded to nose and is an extra heavy truck for the very hardest service.

STORE AND WAREHOUSE TRUCKS

Western Pattern



No. 1, Half Ironed Nos. 2 & 3, Full Ironed

No.	Length Handles, inches	Width Truck, inches	Diameter Wheels, inches	Weight, pounds	With Iron Wheels	With Rubber Wheels
1	48	19	6 1/2	43	\$ 7.00	\$15.00
2	52	20	7 1/2	65	9.00	18.50
3	56	22	9	90	15.00	28.00

SKIDS



Length, feet	Number of Cross Bars	Price Each
6	2	\$ 7.50
8	3	10.00
10	3	12.50
12	4	15.00

BARREL, HANDY AND BAG TRUCKS



Barrel



Bag



Handy

BARREL TRUCK—WESTERN PATTERN

No.	Length Handles, inches	Width, inches	Diameter Wheels, inches	Weight, pounds	Price Each
2	52	20	8 1/2	95	\$11.00

BAG TRUCK

No.	Length Handles, inches	Width, inches	Diameter Wheels, inches	Weight, pounds	Price Each
1	42	11 1/2 x 16 3/4	6	23	\$5.00

HANDY TRUCK

No.	Length Handles, inches	Width, inches	Diameter Wheels, inches	Weight, pounds	Price Each
1	46	12 x 17	6	27	\$3.50

HERCULES STEEL WAREHOUSE TRUCKS



No. 3



No. 4.



No. 4A

Easy running, strong and durable; for railroads, steamships, general warehouse and all heavy service. Constructed of the very best steel. Frames and axles made of steel and wheels of very best quality iron. The angular shapes combine extraordinary strength with lightness. All parts are bound and riveted together, making an exceptionally strong and rigid frame. Handles are first-class hickory, strong and pleasing to the hands. Fully warranted against any imperfections in material and workmanship.

No. 3 Regular: For general work, medium heavy.

No. 4 Regular: For all purposes where a large Truck is required.

No. 4A: Extra heavy; center straps, welded to dash; for hard service.

No.	Full Length, feet	Width, inches	Diameter Wheels, inches	Diameter, Axles, inches	Weight, pounds	Each
3 Regular.....	5	22	8½	1½	90	\$14.00
4 ".....	5 ft. 7 in.	24	10¾	1½	136	17.25
4A.....	5 " 7 "	24	10¾	1½	150	20.25

HERCULES STEEL BARREL TRUCKS

No. 3: For regular work, ordinary barrels, etc.....\$17.25

No. 4: For heavy work, extra strong... 20.25

No. 3

Full length.....5 feet
Width at nose.....16 inches
Width at handles.....25 "
Diameter, wheels.....8½ "
Diameter, axle.....1½ "
Weight.....102 lbs.

No. 4

Full length.....5 ft. 7 in.
Width at nose.....17 inches
Width at handles.....25 "
Diameter, wheels.....10¾ "
Diameter, axles.....1½ "
Weight.....144 lbs.

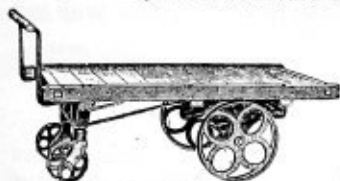


No. 3



No. 4

IMPROVED TRUCKS For Mill, Factory and Warehouse Use

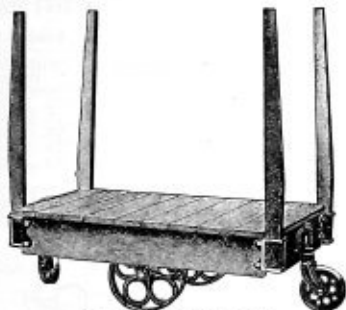

Fig. 500

No.	Size of Platform, feet	Diameter of Wheels, inches	Diameter of Casters, inches	Nominal Capacity, pounds	Weight, pounds	Price Each
A	2 x 4	12	6	1200	165	21.00
B	2½ x 4	12	6	1200	170	22.00
C	3 x 5	12	6	1200	200	25.00
F	3 x 5	18	8	3000	240	32.00

These trucks can be made with boxes, if desired, at advanced prices.

FAVORITE FACTORY TRUCKS Heavy and Strong

Frames made of selected hardwood, thoroughly bolted together, corner pockets set out over the frame, making full size of platform available; pockets are heavy and bolted to frame so as to make an almost indestructible corner.


Cut of No. 2 Truck

No.	Size platform, inches	Diameter of Wheels, inches	Price Each
2	28 x 48	14	\$12.00
3	36 x 60	16	16.00

No. 3 Truck has two castors at each end.

DRY GOODS TRUCKS



No.	Size Platform, inches	Diameter of Wheels, inches	Height of End Racks, inches	Weight, pounds	Price Each
1	24 x 42	7¾	25	175	\$22.00
2	27 x 45	8¾	25	190	25.00

REGULAR WAGON TRUCKS Well and Substantially Made. Selected Hardwood


Fig. 700

No.	Width Platform	Length Platform	Diameter Wheels	Price Each
1	24	36	7¾	\$14.00
2	26	38	7¾	15.00
3	28	40	7¾	16.00
4	30	42	8¾	17.50
5	32	44	8¾	18.50
6	34	46	8¾	20.00

Nos. 1, 2 and 3 add \$12.00 for rubbered wheels. Nos. 4, 5 and 6 add 15.00 for rubbered wheels.

BAGGAGE AND EXPRESS WAGON Made of Carefully Selected Material Heavily Ironed and Handsomely Painted


Fig. 800

No.	Diameter Rear Wheels	Diameter Front Wheels	Size Platform	Weight, pounds	Price Each
1	31	28	39 in. x 10 ft.	670	\$100.00
2	18	18	30 in. x 7 ft.	375	60.00

BAGGAGE WAGON With Sloping Ends and Staggered Wrought Spoke Wheels


Fig. 258

No.	Size of Body, inches	Length of Rack, inches	Diameter Rear Wheels	Diameter Front Wheels	Weight, pounds	Price Each
1	84x26	28	20	22	462	\$70.00
2	120x27	35	20	22	500	80.00
3	144x32	44	20	22	615	90.00

BOX TRUCKS

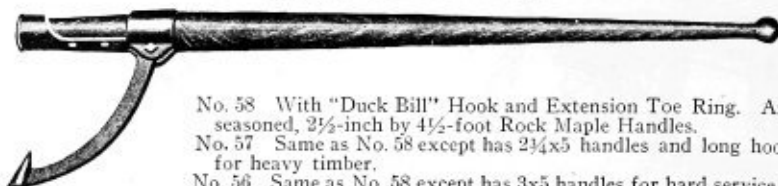


Low trucks, strong and well made, for handling large boxes or bales. Sharp cone head bolts to prevent package from slipping. Axles turned and wheels bored.

No.	Size inches	Size of Wheel, inches	Weight, pounds	Price Each
1	18 x 18	4	27	\$5.00
2	18 x 26	4	32	6.00

"STERLING" STANDARD R. R. AND CONTRACTORS' CANT HOOKS

Malleable Iron Clasp and Extension Toe Ring; Crucible Forged Steel Hook $\frac{7}{8} \times \frac{7}{16}$ Inch With Heavy Upset Head and "Duck Bill" Point



No. 58 With "Duck Bill" Hook and Extension Toe Ring. Air-

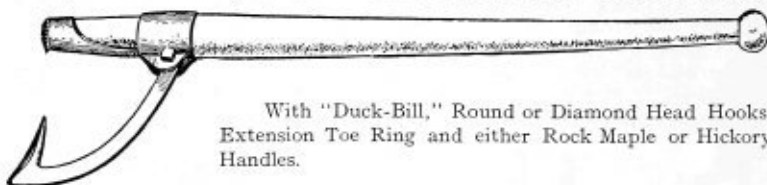
No. 57 Same as No. 58 except has $2\frac{3}{4} \times 5$ handles and long hook for heavy timber.

No. 56 Same as No. 58 except has 3x5 handles for hard service.

These are the Standard Cant Hooks for general use; No. 58 always sent unless otherwise specified.

No. 58	"Sterling" Railroad and Contractors' Cant Hook	Each	\$2. 20	Per Dozen, \$22. 00
No. 57	"Sterling" Railroad and Contractors' Cant Hook	"	3. 30	" " 33. 00
No. 56	"Sterling" Railroad and Contractors' Cant Hook	"	4. 30	" " 43. 00

"STERLING" WROUGHT STEEL CLASP CANT HOOKS

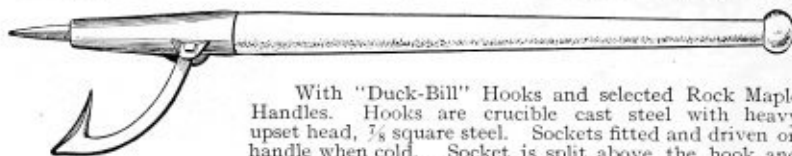


With "Duck-Bill," Round or Diamond Head Hooks,
Extension Toe Ring and either Rock Maple or Hickory
Handles.

Size of Handles	With Rock Maple Handles	With Hickory Handles	Size of Handles	With Rock Maple Handles	With Hickory Handles
2 1/2 in. by 4 1/2 ft.	No. 59. . \$29.83 Doz.	No. 70. . \$33.35 Doz.	2 3/4 in. by 6 ft.	No. 65. . \$43.85 Doz.	No. 76. . \$48.07 Doz.
5 "	" 60. . 30.71 "	" 71. . 34.23 "	3 in. by 4 1/2 "	" 66. . 45.14 "	" 77. . 49.24 "
5 1/2 "	" 61. . 31.59 "	" 72. . 35.11 "	" 5 "	" 67. . 46.16 "	" 78. . 50.27 "
2 3/4 in. by 4 1/2 "	" 62. . 40.73 "	" 73. . 44.92 "	5 1/2 "	" 68. . 47.19 "	" 79. . 51.30 "
5 "	" 63. . 41.77 "	" 74. . 45.97 "	6 "	" 69. . 48.21 "	" 80. . 52.33 "
5 1/4 "	" 64. . 42.81 "	" 75. . 47.02 "			

We send "Duck-Bill" Hook and 2 1/4-inch by 4 1/4-foot Rock Maple Handles unless otherwise specified.

"STERLING" MALLEABLE SPLIT SOCKET PEAVIES

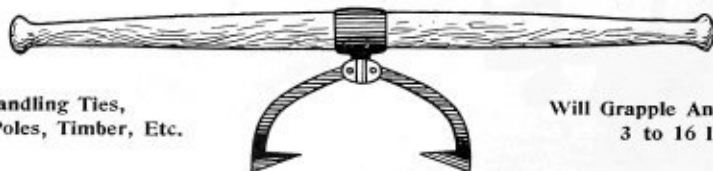


With "Duck-Bill" Hooks and selected Rock Maple Handles. Hooks are crucible cast steel with heavy upset head, $\frac{3}{8}$ square steel. Sockets fitted and driven on handle when cold. Socket is split above the hook and can be tightened by bolt in case of shrinkage of the handle.

No. 81, with 2 3/4 inch by 4 1/2 ft. handles.....	\$39.78 Doz.	No. 85, with 3 inch by 4 1/2 ft. handles.....	\$50.60 Doz.
" 82, " 2 3/4 " " 5 " " "	40.71 "	" 86, " 3 " " 5 " " "	51.70 "
" 83, " 2 3/4 " " 5 1/2 " " "	41.64 "	" 87, " 3 " " 5 1/2 " " "	52.70 "
" 84, " 2 3/4 " " 6 " " "	42.57 "	" 88, " 3 " " 6 " " "	53.70 "

We send 2 $\frac{3}{4}$ -inch by 4 $\frac{1}{2}$ -foot Handles unless otherwise ordered.

No. 106 STERLING LUG HOOKS OR TIMBER CARRIERS



For Handling Ties,
Telegraph Poles, Timber, Etc.

**Will Grapple Anything from
3 to 16 Inches**

Made with swivel to permit carrying timber through narrow passage ways. Crucible steel "Duck-Bill". Hooks, strong swivel and selected air-seasoned Rock Maple Handles.

No. 106. Sterling Standard Lug Hooks.....	Per Dozen, \$43.00
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EXTRA PARTS FOR LUMBERING TOOLS

Duck Bill Hook



Fig. 25

Extension Toe Ring



Fig. 23

Forged Steel Clasp



Fig. 16

Malleable Iron Clasp



Fig. 17

Toe Ring



Fig. 24

Round Point Hook



Fig. 26

Cant Hook Clip



Fig. 22

Straight Pike

Fig. 18
Pike and Hook

Fig. 21

Solid Socket

Can furnish same in split socket



Fig. 15

Peavy Pike



Fig. 19

Pike Pole Ferrules



Fig. 28

HOOKS FOR PEAVIES AND CANT HOOKS

Heavy Upset Heads, Round, Duck Bill or Diamond Points

Size	$\frac{7}{8} \times \frac{7}{8}$ steel	Per dozen	\$11.00
"	$1 \times \frac{7}{8}$ " "	"	12.50
"	$1 \times 1 \frac{1}{2}$ " "	"	15.00
"	$1 \frac{1}{2} \times 1 \frac{1}{2}$ " "	"	17.50
"	$1 \frac{1}{2} \times 2$ " "	"	21.00
"	2×2 " "	"	25.00

Fig. 23. EXTENSION TOE RINGS

Malleable Iron

For all size tools.....Per dozen, \$2.50

Fig. 24. SHORT TOE RINGS

Malleable iron.....Per dozen \$1.50

Forged steel....." 2.50

Fig. 22. CANT HOOK CLIPS OR CLIP CLASPS

Malleable Iron

All sizes.....Per dozen, \$3.00

Fig. 15. MALLEABLE IRON SOCKETS FOR PEAVIES

Either Solid or Split

For	$2 \frac{1}{2}$ -inch tools	Per dozen	\$10.00
"	$2 \frac{3}{4}$ " " "	"	10.00
"	3 " " "	"	11.25
"	$3 \frac{1}{2}$ " " "	"	12.50

Fig. 16. HAND FORGED STEEL CLASPS, WITH BOLTS

For $2 \frac{1}{2}$ -inch tools.....Per dozen, \$7.75" $2 \frac{3}{4}$ " " " " " " " 8.30" 3 " " " " " " " 9.50

Fig. 17. MALLEABLE IRON CLASPS, WITH BOLTS

For $2 \frac{1}{2}$ -inch tools.....Per dozen, \$5.00" $2 \frac{3}{4}$ " " " " " " " 5.75" 3 " " " " " " " 7.00

Fig. 18. PIKE POLE PIKES, STRAIGHT

With plain or threaded tangs.....Per dozen, \$6.25

Fig. 21. PIKE POLE PIKES, WITH HOOKS

With plain or threaded tangs.....Per dozen, \$10.00

Fig. 28. PIKE POLE FERRULES, SEAMLESS

Price per dozen sets.....\$4.50

STEEL CANT HOOK AND PEAVY BOLTS

 $\frac{7}{8} \times 1 \frac{3}{4}$Per 100, \$6.00

Fig. 19. PEAVY PICKS OR PIKES

Forged Steel

For all size tools.....Per dozen, \$7.75

TIMBER CARRIER CLASPS

Not shown above.....Per dozen, \$12.50

CANT HOOK AND PEAVY HANDLES

Extra Grade, Selected and Finished

Rock Maple

$2 \frac{1}{2}$ -inch by..	4 ft.	$4 \frac{1}{2}$ ft.	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.
Per dozen.....	\$3.10	3.40	3.80	4.20	4.60
$2 \frac{3}{4}$ -inch by.....	$4 \frac{1}{2}$ ft.	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.	
Per dozen.....	\$4.20	4.60	5.00	5.40	
3-inch by.....	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.		
Per dozen.....	\$5.40	5.80	6.20		

Hickory Handles

$2 \frac{1}{2}$ -inch by..	4 ft.	$4 \frac{1}{2}$ ft.	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.
Per dozen.....	\$5.00	5.50	5.90	6.30	6.70
$2 \frac{3}{4}$ -inch by.....	$4 \frac{1}{2}$ ft.	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.	
Per dozen.....	\$6.50	6.90	7.30	7.70	
3-inch by.....	5 ft.	$5 \frac{1}{2}$ ft.	6 ft.		
Per dozen.....	\$7.90	8.30	8.70		

Handles bored for heavy pick, add 25 cents per dozen.

LUG HOOK HANDLES

Length, feet.....	4	$4 \frac{1}{2}$	5
Price per dozen.....	\$4.00	4.50	5.00

ASH PIKE POLES



With Pike Only

Poles are made from best quality second growth white ash, oil finished. Pikes and hooks are hand forged from one piece of crucible steel. Ferrules are made seamless from Norway iron and are very strong; cannot possibly become loose.



With Pike and Hook

Length, feet	WITH PIKE AND HOOK		WITH PIKE ONLY		HANDLES ONLY, NO IRONS	
	Each	Per Dozen	Each	Per Dozen	Each	Per Dozen
10	\$2.10	\$21.00	\$1.80	\$18.00	\$1.30	\$13.25
12	2.35	23.75	2.05	20.75	1.40	14.00
14	2.85	28.50	2.55	25.50	1.75	17.50
16	3.50	35.00	3.20	32.00	2.20	22.00
18	4.50	45.00	4.20	42.00	3.10	31.25
20	6.00	60.00	5.70	57.00	4.75	47.50

PICKAROONS

For Handling Ties and Mill Refuse



Rock maple handles, 36 inches long, 1 1/4 inches at butt. Pikes forged from one piece of crucible steel.

No.	Style	Price Each	Price, per Dozen
418	With hook only	\$1.75	\$17.75
419	With pike and hook	1.85	18.50

HOOKAROONS WITH AXE HANDLES



For handling pulp wood, cedar posts, etc. Complete with axe handle, each, \$1.50, per doz., \$15.00. Without handle " 1.00, " " 10.00. Extra handles " .60, " " 5.75.

STEEL LOADING HOOKS



No.	Size, Steel	Style, Point	Price Each	Price per Doz.
559	3/4 Square	Round	\$1.75	\$17.50
560	3/4 Octagon	"	1.75	17.50
561	1x1 1/2 Flat	Chisel	1.50	15.00

STEEL SWAMP HOOK



No.	Size, Steel	Point	Price Each	Price per Doz.
550	1	Round	\$3.00	\$30.00
551	1 1/2	"	3.25	32.50
552	1 3/4	"	3.75	37.50

SKIDDING TONGS

Hooks Hand Forged from Best Crucible Steel With Plain Swivel and Grab Hook



No.	Size, Steel	Opens, inches	Price per Pair	Price per Doz.
114	1 1/2 x 5/8 Flat	32	\$ 9.00	\$ 90.00
118	1 Octagon	24	8.25	82.50
119	1 1/4 "	32	9.00	90.00
120	1 1/4 "	36	10.50	105.00

GIANT TONGS

Same as Cut Above but without Grab Hook

All hand forged of best hammered crucible steel with rings and clevises of Norway iron; chilled steel rivets.

No.	Size, Steel	Opens, inches	Weight, lbs.	Price per Pair
512	1 1/2 Octagon	32	45	\$12.50
513	"	36	48	13.15
514	"	42	51	14.40
525	1 3/4 Octagon	42	75	21.25
526	"	48	80	22.50
527	"	54	85	23.75
528	"	60	91	25.50

For rafting dogs, chain dogs, hooks and blocks, see index.

TIMBER TRUCKS OR DOLLIES

These Trucks can be inverted and used as rollers. Frames are of hard maple, thoroughly bolted; rollers are of pipe with cast heads shrunk on.



With Straight Face Roller

No.	Diam. of Roller	Size Frame	Weight Lbs.	Price Each
2	5 in. Reg. Size	18x18	46	\$ 7.00
3	6 in. Reg. Size	18x18	55	8.00
4	7 in. Heavy	23x23	72	9.00
5	8 in. Extra Heavy	26x26	115	11.00

No. 3, with 6 inch rollers, is the popular size and this is the one we send when size is not mentioned.

CONCAVE FACE DOLLIES



No. 6 Concave Dollies

Rollers 12½ inches long, 7¼ inch diameter at each end, and 3¾ inch diameter at center; frame 18x18 inches; weight 52 lbs.

Price.....\$8.50

No. 7 HORSE SHOE DOLLIES



For pushing lumber from or on to a pile. Can be placed near the edge and used from the ground. Roller, 14x4 inches in diameter.

Each.....\$5.00

UNIVERSAL "BOGIE" ROLLER

Capacity 4 Tons

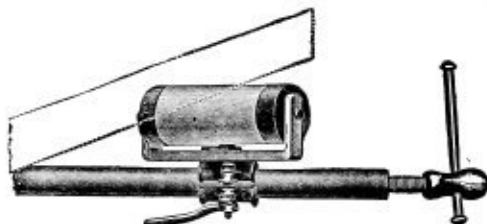


Has two independent rollers on the same axle, which works same as a two-wheel truck, swinging around as if on a pivot.

Maple platform with wrought iron frame riveted.

Height over all, 8 inches; rollers, 5½ inches; length, 24 inches; width, 18 inches; weight, 100 lbs. Price\$15.00

No. 9 SIDE ROLLERS



The Roller is made of metal tubing, and is very strong. It is easily placed in car doors, hatchways of vessels, etc. The roller slides along the stock, and can be clamped rigidly at any position required. No. 9. Side Rollers.....Each, \$9.00

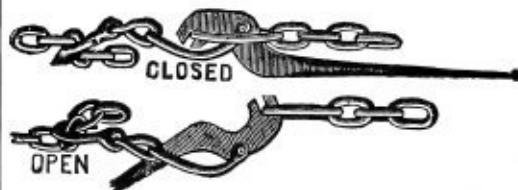
No. 8 END ROLLERS



These Rollers are especially adapted for the ends of cars. Roller, 14x4 inches in diameter.

Each.....\$3.00

LOG BINDERS

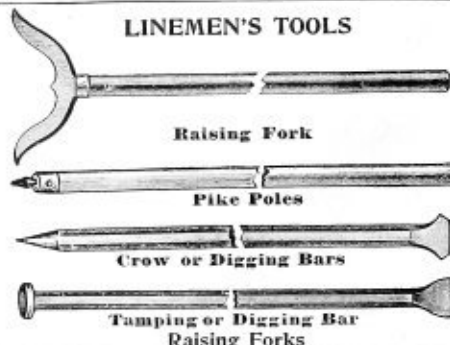


For binding logs on sleighs or cars; does away with binding poles entirely.

Price each.....\$ 3.00

Price per dozen.....36.00

LINEMEN'S TOOLS



Length Over All, feet	Diameter Handle, inches	HANDLES	
		Wood, Price Each	Iron, Price Each
10	1 1/4	\$2.80	\$2.50
12	1 1/4	3.00	2.70
14	1 1/4	3.20	2.90
16	1 1/4	3.40	3.10
18	1 1/4	3.60	3.30

Pike Poles

Length Over All, feet	Diameter Handles, inches	Price Each
12	2 1/2	\$2.00
14	2 1/2	2.20
16	2 1/2	2.40
18	2 1/2	2.80

Crow and Tamping Bars—Octagon Steel

Length Over All, feet	Diameter, inches	CROW		TAMPING	
		Weight, pounds	Price Each	Weight, pounds	Price Each
6	1 1/4	23	\$4.00		
8	1 1/4	24	4.00		
8	1 1/4	30	4.80		
8	1 1/4			25	\$4.50
8	1 1/4			31	5.00



JENNEY POLE SUPPORTS

Height, feet	Weight, pounds	Price Each
6	34	\$7.00
7	36	7.50
8	38	9.00

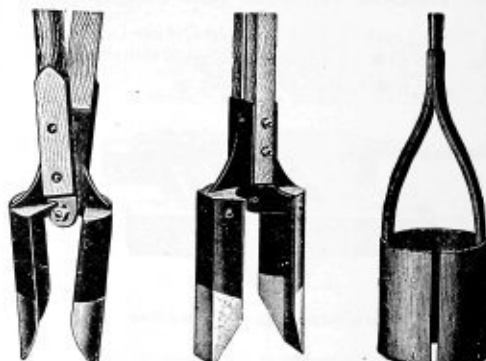
PAVING RAMMERS



Granite Rammer

Kind	Weight, pounds	Price Each
Granite	56	\$15.00
Cobblestone	50	12.00

IMPROVED POST HOLE DIGGERS



Eureka

Hexagon

Champion

Eureka: Blades of solid cast steel and thoroughly tempered. Best grade of handles, well matched and seasoned.

Hexagon: A two-handled digger so constructed as to overcome weakness where handles are fastened to blade.

Champion: All steel construction. Curved blade. Best material used throughout.

Eureka—Standard Pattern

Weight to Dozen, pounds	Length Blade, inches	Length Over All, feet	Price, Each	Price, Dozen
110	9	5	\$1.20	\$12.00

Eureka—Heavy Pattern

Weight to Dozen, pounds	Length Blade, inches	Length Over All, feet	Price, Each	Price, Dozen
140	9	5	\$1.75	\$17.50

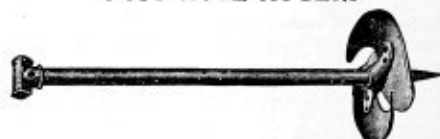
Hexagon

Weight to Dozen, pounds	Length Blade, inches	Length Over All, feet	Price, Each	Price, Dozen
120	9	4 ft. 10 in.	\$1.40	\$14.00

Champion

Weight to Dozen, pounds	Length Blade, inches	Length Over All, feet	Price, Each	Price, Dozen
140	6	5	\$1.00	\$10.00

POST HOLE AUGERS



Tubular iron handles. Malleable frame. Forged steel blades. Blades riveted to frame.

Size Blades, inches	Augers Complete	Blades, Each	Handles, Each	Points, Each
6	\$2.00	\$0.75	\$1.00	\$0.75
7	2.00	.75	1.00	.75
8	2.00	.75	1.00	.75
9	2.00	.75	1.00	.75

Extra Heavy Augers for Telegraph Use

Size Blades, inches	Length H'ndls	Complete Price Each	Extra Points, Each	Extra Blades, Each	Extra Bottoms, Each	Extra Handles, Each
12	6	\$8.00	\$1.00	\$1.50	\$4.00	\$2.00
14	6	9.00	1.00	1.75	4.50	2.00
14	8	10.00	1.00	2.75	4.50	3.00

JACK SCREWS

Locomotive or
Screw JacksCar Box
Jack ScrewsBell Base Ratchet
Jack ScrewsTripod Ratchet
Jack Screws

Locomotive Jacks or Screw Jacks. Stands are cast from best quality gray iron that can be procured. Screws are wrought steel with machine cut threads; levers are extra and are sent only when ordered. Sizes other than shown are not carried in stock but furnished upon short notice.

Car Box Jack Screws. Have swivel caps same diameter as head, closed at top to prevent any dirt from entering between cap and screw. Cap is held in place by set screw running in groove at top. These Jacks are not carried in Chicago stock but can be furnished promptly from factory.

Bell Base Ratchet Jack Screws. Have wrought steel screws with machine cut threads. Stands and caps are cast from the very best quality of gray iron; steel ratchets, pawls and handles.

Tripod Ratchet Jack Screws. Wrought steel screws with machine cut threads, steel legs and base, steel ratchets, pawls and handles and brass nuts.

LOCOMOTIVE JACKS OR
SCREW JACKS

Diam. of Screw, inches	Height of Stand, inches	Capacity Tons	Price, Each
1 1/4	4	10	\$ 2.90
1 1/4	6	10	3.10
1 1/4	8	10	3.40
1 1/4	10	10	3.80
1 1/4	12	10	4.20
1 1/4	6	12	3.75
1 1/4	8	12	4.25
1 1/4	10	12	4.75
1 1/4	12	12	5.25
1 1/4	5	20	5.00
1 1/4	6	20	5.25
1 1/4	8	20	6.00
1 1/4	10	20	6.75
1 1/4	12	20	7.50
1 1/4	14	20	8.25
1 1/4	16	20	9.25
1 1/4	18	20	10.25
1 1/4	20	20	11.50
1 1/4	10	24	8.25
1 1/4	12	24	9.00
1 1/4	14	24	10.00
1 1/4	6	28	7.75
1 1/4	8	28	8.75
1 1/4	10	28	9.75
1 1/4	12	28	10.75
1 1/4	14	28	12.00
1 1/4	16	28	13.25
1 1/4	18	28	14.50
1 1/4	20	28	15.75
1 1/4	24	28	18.25
1 1/4	32	28	26.00
1 1/4	14	36	19.50
1 1/4	16	36	20.75
1 1/4	18	36	22.00
1 1/4	20	36	23.25
1 1/4	24	36	25.75
1 1/4	30	36	30.00

CAR BOX JACK SCREWS

Diam. of Screw, inches	Height of Stand, inches	Capacity Tons	Price
1 1/4	5	12	\$ 4.00
1 1/4	6	12	4.25
1 1/4	8	12	4.75
1 1/4	10	12	5.25
1 1/4	12	12	5.75
1 1/4	6	16	5.00
1 1/4	8	16	5.50
1 1/4	10	16	6.25
1 1/4	12	16	6.75
1 1/4	5	20	5.50
1 1/4	6	20	5.75
1 1/4	8	20	6.50
1 1/4	10	20	7.25
1 1/4	12	20	8.00
1 1/4	14	20	8.75
1 1/4	8	24	8.00
1 1/4	10	24	8.75
1 1/4	12	24	9.50
1 1/4	14	24	10.50
1 1/4	16	24	11.50
1 1/4	6 1/2	28	8.50
1 1/4	8	28	9.25
1 1/4	10	28	10.25
1 1/4	12	28	11.25
1 1/4	14	28	12.50
1 1/4	16	28	13.75

BELL BASE RATCHET
JACK SCREWS

Diam. of Screw, inches	Height Over all, inches	Capacity Tons	Price, Each
2	12	24	\$16.00
2	16	24	17.50
2	20	24	19.00
2	24	24	20.50
2	28	24	22.50
2	30	24	25.50
2 1/4	18	28	21.00
2 1/4	24	28	24.00
2 1/4	30	28	27.00
2 1/4	18	32	22.50
2 1/4	24	32	25.50
2 1/4	30	32	29.00
2 1/4	36	32	35.00
2 1/4	24	36	30.00
2 1/4	30	36	34.00
2 1/4	36	36	35.00
3	24	40	45.00
3	36	40	48.00

TRIPOD RATCHET JACKS

Diam. of Screw, inches	Height Over all, inches	Capacity Tons	Price, Each
2 1/4	18	28	\$50.00
2 1/4	24	28	53.00
2 1/4	18	32	56.50
2 1/4	24	32	59.50
2 1/4	30	32	63.25
2 1/4	36	32	67.00
2 1/4	24	36	65.00
2 1/4	30	36	68.75
3	24	40	70.00
3	36	40	79.00

BARRETT LIFTING JACKS



**Double-acting
Trip Jack**



**Double-acting Auto-
matic Lowering Jack**



**Single-acting Auto-
matic Lowering Jack**



**Geared Ratchet
Lever Jack**

Double-acting Trip Jacks. Compound leverage; for lifting only, on both upward and downward stroke; load can be dropped instantly from any point.

Double-acting Automatic Lowering Jacks. Lift or lower on both upward and downward strokes. The No. 10 of this series has tripping device, making it a combination Jack which lifts, lowers, reverses motion, and will trip or drop load from any elevation.

Single-acting Automatic Lowering Jacks. Lift or lower on downward stroke only.

Geared Ratchet Lever Jacks. Single acting; lift on downward stroke only.

No.	DESCRIPTION	Capacity, tons	Height with Bar Down, inches	Raise of Bar, inches	Size of Bar, inches	Weight, pounds	Price
*1	Double-acting Track or Trip	10	24	13½	1½x1½	62	\$ 18.00
6	" " Gang Track or Trip	15	31	19	1½x1½	105	32.00
2	" " Automatic Lowering	10	21	10	1½x1½	73	25.00
3	" " " " (heavy)	12	26½	15	1¾x1¾	85	30.00
4	" " " " (extra heavy) ..	15	22	10	2 x2	100	35.00
5	" " " " (long lift)	15	28	15	2 x2	115	40.00
10	" " Combined Trip and Auto. Lowering ..	10	24¼	14	1½x1½	75	25.00
50	" " Automatic Lowering (light work) ..	5	16	8	1¼x1¼	33	16.00
51	Same as No. 50, but 5 inches higher	5	21	13	1¼x1¼	40	18.00
18	Single-acting Automatic Lowering	10	21	10	1½x1½	68	25.00
19	" " " " "	15	28	17½	2 x2	102	35.00
29	" " Geared Ratchet Lever	25	28	17	2½x2¼	175	95.00
30	" " " " Compound Levers ..	35	28	17	2½x3	225	120.00
31	" " " " Lever	35	36	25	2½x3	260	130.00

*The No. 1 is the recognized standard track Jack.

†The weights given include levers.

Barrett Jacks have malleable iron frame or base, forged steel rack with machine-cut teeth, drop forged O. H. steel pawls and hardened steel bearings. Perfectly designed and carefully made, insuring safety, strength and comparatively light weight.

No. 502 2-TON LEVER JACK

A simple and popular Jack for general use. Single acting; raises load on downward stroke.

Capacity.....2 Tons
Height, Bar Down...18½ inches
Rise of Bar.....10 "
Size of Bar....1¼x1¼ "
Weight.....28 pounds
Price Each.....\$10.00



No. 4 3-TON BARTH JACK

A double acting reversible 3-ton general purpose jack.

Capacity.....3 Tons
Height, Bar down...14 inches
Rise of Bar.....8 "
Weight.....20 pounds



THE PEARSON CAR-REPLACING JACK

Especially Adapted for
Street Railways

The quickest working jack made for replacing derailed cars.

Works at an angle with same force as if working perpendicularly.

Has socket bearing head and foot.



Jack at an Angle

Jacks in Pairs, Will Raise Tons	Weight, Pounds Each	Length Closed, Inches	Hoists, Inches	Diam. Screw, Inches	Bar Jacks, Price per Pair	Ratchet Jacks, Price per Pair
50	85	28	14	...	...	\$67.50
25	60	24	12	2	\$35.00	45.00
15	30	24	14	1½	25.00	35.00
10	25	20	9	1¼	22.50	32.50
10	22	18	8½	1¼	20.00	30.00
8	20	16	6½	1¼	18.00	28.00
8	18	14	4½	1¼	18.00	28.00

JENNE FRICTION TRACK JACKS

No. 1 jack is used for surfacing and general track repairs.

No. 2 for heavy ballasting, surfacing and track repairing.

Frame and lever sockets of malleable iron, round lifting bar, steel pivots, bronze boxes, rings, hanger and lifting bar made of refined wrought iron.



No.	Cap., Tons	Height Bar Down, Inches	Raise of Bar, Inches	Diam. of Bar, Inches	Weight, Pounds	Price
1	5	31	12	1½	60	\$20.00
2	10	35	15	1¾	90	24.00

Furnished complete with wooden lever MALLEABLE IRON WAGON JACKS



"New Samson"



"Oliver"

"New Samson"			
No.	Weight, pounds	For Vehicles Weighing	Price Each
4	16	2 Tons	\$4.00
5	25	6 "	5.00
6	32	8 "	7.00

"Oliver"			
No.	Weight, pounds	For Vehicles Weighing	Price Each
1	7	1 Ton	\$1.25
2	10	2 "	2.00
3	16	3 "	3.00
4	20	4 "	4.00

No. 00 AUTOMOBILE OR WAGON JACK

Capacity 1 ton, weight 8½ lbs.

This jack is double-acting, raising the load on both the upward and downward strokes of the lever and lowers the load in the same manner by simply turning eccentric or button indicator at the side.

Has foot lift or claw and will work at any angle.

Capacity, 1 ton, height with bar down is 12 inches, raise of bar 6 inches, bar ¾x1½ inches, weight, 8½ pounds. Price \$5.00



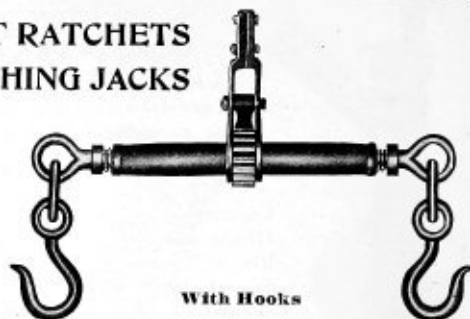
No. 00 Jack

H.Channon Company. Chicago.

CHANNON STEAMBOAT RATCHETS OR PULLING AND PUSHING JACKS



With Locking Link



With Hooks

Steel and malleable iron, strong and well made in every respect; screws have square cut threads. Extensively used by railroads, contractors, etc.

No.	Length, inches	Diam. Screw, inches	Price Each	No.	Length, inches	Diameter Screw, inches	Price Each
1	18	1 3/8	\$ 8.50	6	24	1 3/4	\$17.00
2	24	1 3/8	9.50	7	28	1 3/4	18.00
3	30	1 3/8	10.00	8	30	1 3/4	19.00
4	36	1 3/8	11.00	9	36	1 3/4	20.00
5	18	1 3/4	16.00	10	48	1 3/4	24.00

PEARSON PULLING AND PUSHING JACKS



Nos. 1 and 2 With Hooks For Pulling Only



Nos. 3 and 4 for Pulling and Pushing

Made in two sizes, of malleable iron and steel. Largely used in repairing steel cars and trucks; also in all classes of structural work, pile driving, etc. A valuable addition to wrecking outfit.

No.	Capacity, Tons	Weight, pounds	Length, Closed	Run of Screw, inches	Price Each	No.	Capacity, Tons	Weight, pounds	Length, Closed	Run of Screw, inches	Price Each
1	7	35	33	12	\$17.50	3	7	35	33	12	\$17.50
2	10	50	33	12	22.50	4	10	50	33	12	22.50

HOUSE RAISING JACKS

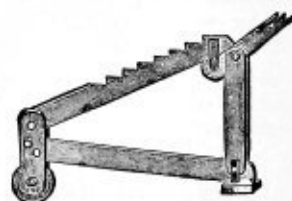


Best quality gray iron castings. Screws are cast with seamless threads making them smooth and uniform. 3x24 inch (the standard size) carried in stock; other sizes furnished on short notice.

Diameter of Screw, inches	Height Over All, inches	Price Each
3	18	\$3.25
3	20	3.50
3	22	3.75
*3	24	4.00
3	26	4.25
3	28	4.50
3	30	4.75
3	32	5.00
3	34	5.25
3	36	5.50

*Standard.

HARD MAPLE WAGON JACKS



Rests in front on a wheel and is pushed under the vehicle until the axle rests on the notched bar; pulling down the handle will raise from 1 to 3 inches, and locks by passing the center.

Has mortised foot board and steel braces.

Description	Thickness	Price Each
No. 0. Will raise vehicles weighing 1 ton	1 in.	1.25
No. 00. " " " " " 2 " "	1 3/4 "	1.50
No. 000. " " " " " 3 " "	1 3/4 "	2.00

CHANNON IMPROVED STONE AND MACHINERY JACKS

BEST STEEL FORGINGS, SIMPLE, STRONG AND EFFICIENT

**Malleable Iron Frame Jacks****Wooden Frame Jacks**

These Jacks are largely used by stone companies, marble works, quarries and stone yards, cemeteries, safe movers, foundries, machine and bridge shops, mining companies, etc. Also for moving and erecting machinery of all kinds.

They are safe, simple and reliable, consisting only of rack, pinion and gears contained in and protected by the iron housing; there are no cams, springs or tripping devices to get out of order or become lost, hence they are preferred by those employing inexperienced workmen as they are easily handled and quickly placed.

The rack, pinion and gears are milled from solid forged steel blanks.

The iron frame jacks are preferred by most, as the malleable frame is unbreakable and has no wooden parts to break or rot off.

At a slight advance we furnish jacks with all bearings bushed with our self-lubricating *bronze bushings* which require no oil or attention.

Jacks may be operated at any angle. (Notice the points at base to prevent slipping.)

All jacks furnished with swivel head, foot-lift and cranks.

Sizes and Prices

No.	Lifting Capacity, Tons	Approximate Weight, Lbs.	List Price, Iron or Wood Frame Jacks	List Price, Jacks with Self- Lubricating Bronze- Bushed Bearings
13	3	105	\$ 50.00	\$ 53.00
14	5	130	62.00	66.00
15	8	190	84.00	89.00
16	10	200	110.00	116.00
17	15	300	140.00	147.00
18	20	415	162.00	170.00

Capacity when lifting on claw is one half of above rating.

H.Channon Company. Chicago.

NORTON BALL-BEARING BRIDGE JACKS



60 and 70 Ton Jacks



50 Ton Jack



15 and 35 Ton Jacks

Capacity, Tons	Height, inches	Rise, inches	Diameter of Base, inches	Diameter of Head, inches	Weight, Pounds	Price Each
15	22	10	8x 8	5½	115	\$ 60.00
25	26	13	8x 9	5½	157	96.00
25	22	10	8x 9	5½	136	90.00
35	22	10	8x10	6½	190	130.00
35	26	13	8x10	6½	230	138.00
50	24	9	14	10½	270	150.00
50	27	13	14	10½	288	150.00
60	27	12	14	10½	340	175.00
70	27	12	14	10½	340	200.00

Jacks will lift on foot about one-half their rated capacity.

BUDA BALL BEARING JACKS

No.	Capacity, Tons	Height, inches	Rise, inches	Diameter Base, inches	Weight, Pounds	Price Each	Hook Extra
101	25	33	20	12	154	\$ 95.00	\$6.00
102	15	34	20	12	154	75.00	6.00
104	15	22	10	10	80	60.00	6.00
110	25	24	11	13	149	85.00	6.00
O	35	26	13	12	165	125.00	8.00
MX	35	20	8¾	12	135	120.00	8.00
116	50	24	9	14	270	150.00	Foot
117	50	27	13	14	292	150.00	Foot
125	60	26	12	14	323	175.00	Foot
127	75	26	12	14	385	200.00	Foot



TELESCOPIC STEEL JACK SCREWS

These jacks consist of two screws, one working within the other. By this method of construction, the screw can be run out nearly twice the height of the base, making them the shortest jacks in use for the length of lift.

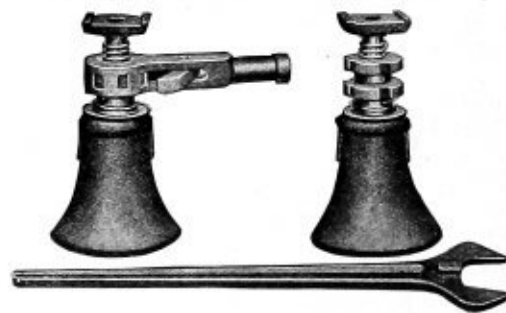


Fig. 2, at left, has ratchet lever. Fig. 1, at right, has wrench lever shown at bottom

No.	Capacity, Tons	Stand, inches	Screw, inches	Net Rise, inches	Whole Length, inches	PRICE EACH	
						Figure 1	Figure 2
1	10	10	14	11	21	\$14.00	\$20.00
2	25	14	20	16	30	18.00	24.00
3	25	17	27	23	40	22.00	28.00
4	25	21	35	31	52	28.00	30.00
5	25	25	40	36	61	30.00	36.00

PLAIN OR SMALL BASE HYDRAULIC JACKS

Intended for use where a firm foundation can be secured, and for operating in close spaces that will not admit a jack with a larger base.



Capacity, Tons	Raise, Inches	Height When Down, Inches	Wgt., Lbs.	List Price
4	12	24½	55	\$58.00
5	4	12	27	50.00
7	12	25¼	67	62.00
7	18	31¼	77	68.00
7	24	38	95	74.00
10	12	25¼	95	66.00
10	18	31¼	108	76.00
10	24	38½	128	86.00
15	12	25¼	120	82.00
15	18	31½	135	96.00
15	24	38	155	110.00
20	12	26½	160	96.00
20	18	32½	180	118.00
20	24	38½	197	140.00
30	9	22½	176	128.00
30	12	26	192	136.00
30	18	32	220	160.00
40	12	26½	240	176.00
40	18	33	272	200.00
50	12	27	270	206.00

40 and 50 ton jacks are all steel

BROAD BASE HYDRAULIC JACKS

The increased area of the base in this style of jack gives it a solid foundation for use where steadiness is required.



Capacity, Tons	Raise, Inches	Height When Down, Inches	Wgt., Lbs.	List Price
4	12	24	75	\$62.00
7	12	25	88	68.00
7	18	31	95	74.00
7	24	37½	110	80.00
10	12	25	120	76.00
10	18	31	130	88.00
10	24	37½	150	100.00
15	12	25½	150	100.00
15	18	31½	162	116.00
15	24	38	185	132.00
20	12	26½	190	124.00
20	18	32½	210	144.00
20	24	38½	231	164.00
30	9	22½	208	152.00
30	12	26½	230	162.00
30	18	32½	250	190.00
40	12	26½	260	200.00
40	18	33	300	230.00
50	12	28	320	240.00
50	18	34½	365	270.00

CLAW HYDRAULIC JACKS

The claw on this style, being close to the ground, is intended for raising loads that are not of sufficient height to admit the head of jack.

Will run out horizontally about their entire lift, and entire rise may be attained by slightly raising head to keep pump submerged.



Capacity, Tons	Raise, Inches	Height When Down, Inches	Wgt., Lbs.	List Price
4	12	24½	78	\$66.00
7	12	25	95	74.00
7	18	30½	110	80.00
10	12	26	145	84.00
10	18	32	162	94.00
15	12	25¼	175	120.00
15	18	32	195	136.00
20	12	26½	205	160.00
20	18	32½	240	180.00
30	12	26½	275	200.00
30	18	32½	310	220.00
40	12	26½	310	240.00

40-ton jacks are all steel

HORIZONTAL CLAW HYDRAULIC JACKS

These jacks are of the same style as those listed above. Reservoir in head is of sufficient capacity to keep pump submerged when jack is operated horizontally, making jack better adapted for horizontal use, although it will lift equally as well vertically.



Capacity, Tons	Raise, Inches	Height When Down, Inches	Wgt., Lbs.	List Price
7	12	25	105	\$74.00
7	18	30½	120	80.00
10	12	26	155	84.00
10	18	32	170	94.00
15	12	25¼	190	120.00
15	18	32	215	136.00
20	12	26½	230	160.00
20	18	32½	270	180.00
30	12	26½	305	200.00
40	12	26½	350	240.00



"KEY RELEASE" CLAW HYDRAULIC JACKS

Will run out horizontally about their entire lift, and entire run-out may be attained by slightly raising head to keep pump submerged. This jack is lowered by means of the key which is independent of the lever used in raising.

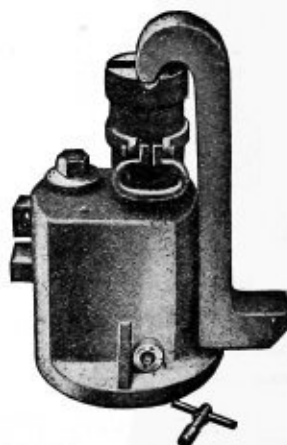
Capacity, Tons	Raise, Inches	Height When Down, Inches	Height of Claw, Inches	Weight, Lbs.	Price
10	12	26½	6	140	\$120.00
10	18	32½	6	150	130.00
15	12	27	6½	160	140.00
15	18	33	6½	185	150.00
20	12	27½	6½	195	160.00
20	18	33½	6½	225	170.00
30	12	28	7	250	180.00
30	18	34	7	285	200.00
40	12	28	7	310	230.00

40-ton jacks are all steel.

"HORIZONTAL" OR "LOW" HYDRAULIC JACKS

So called because they will run out as far horizontally as vertically, and their heights are about 5 inches less than the regular styles.

Capacity, Tons	Rise, Inches	Height When Down, Inches	Diameter of Base, Inches	Weight, Lbs.	List Price	Extra for Claw
7	12	20	9 x 5½	100	\$ 65.00	\$ 8.00
7	18	26	9 x 5½	115	75.00	10.00
10	12	20	10	140	80.00	8.00
10	18	26	10	155	95.00	10.00
10	24	32	10	170	110.00	12.00
15	12	20	12	180	100.00	10.00
15	18	26	12	200	120.00	12.00
15	24	32	12	220	140.00	14.00
20	12	20	12	190	120.00	12.00
20	18	26	12	220	145.00	15.00
20	24	32	12	250	170.00	18.00
30	12	21	13	245	145.00	16.00
30	18	27	13	280	170.00	21.00
40	12	21	13	300	165.00	20.00
40	18	27	13	335	190.00	25.00
50	12	21	14	345	190.00	22.00
50	18	27	14	375	215.00	27.00
80	12	22	18	425	240.00	30.00



CAR BRASS HYDRAULIC JACKS

Same design as above. Tube and ram of seamless steel, pump of brass, base of malleable iron, capacity 10 tons, raise 5 inches, height when down 11 inches, base 8x5 inches, weight 57 lbs. Price\$70.00

"W-S OUTSIDE PUMP" VERTICAL HYDRAULIC JACKS

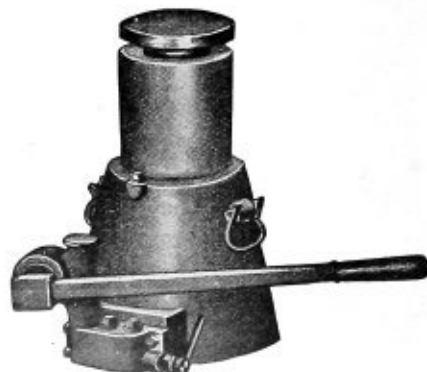
This style used for wrecking, dry docks, pressing flanges on wagon wheel hubs, hauling oil well pipes, etc.

Jack to Lift, Tons	Rise, Inches	Total Height, Inches	Diameter of Base, Inches	Weight, Lbs.	Price Each
60	9	17½	12	325	\$220.00
60	12	20½	12	360	240.00
60	18	26½	12	400	260.00
100	9	17½	13	405	275.00
100	12	20½	13	460	300.00
100	18	26½	13	545	340.00
125	12	20½	14	600	360.00
150	12	20½	15	800	425.00
200	9	19	18½	1,000	450.00
200	12	22	18½	1,200	500.00
200	18	28	18½	1,500	575.00

9-inch raise built to order only.

Pump extends 4½ inches at one side.

If wanted without cap on ram, deduct 2 inches from total height.



"DUNN" ALL IRON, EXTENSIBLE TRENCH BRACES



Complete Brace, with Pipe and Fittings

Length of Brace Over All, Closed	Diam. Screw and Pipe	Length of Screw	Weight, per Dozen	Per Dozen Complete	FITTINGS ONLY—No PIPE	
					Screw Ends, Complete	Socket Butts, Complete
16 inches	1½ inches	11	212	\$23.00	1½" x 12" Screw \$15.00 doz.	\$ 5.00 dozen
18 "	"	12	220	23.00	" x 14" "	5.00 "
21 "	"	14	240	24.00	" x 16" "	5.00 "
24 "	"	14	252	24.00	" x 18" "	5.00 "
27 "	"	16	270	26.00	2" x 18" "	12.00 "
30 "	"	16	280	26.00		
36 "	"	18	300	27.00		
42 "	"	18	312	28.00		
48 "	"	18	325	29.00		
42 inches	2 inches	18	564	\$2.00	Cut pipe 7 inches shorter than length of complete Braces wanted, when closed.	
48 "	"	18	586	\$3.00	Simply plain pipe is required for the bar- rel; drill small hole in one end for cotter pin. Adapted to any width of trench by changing length of pipe.	
54 "	"	18	608	\$4.00		
60 "	"	18	630	\$5.00		

Safe limit of extension, 6 to 10 inches, according to length of Brace.

THE "ALLIANCE" EXTENSIBLE TRENCH BRACES

(Rue's Patent) Covered Screws and Folding Handles



Folding Handles

**Screws Entirely
Covered and Protected
from Dirt and Grit**

The Alliance is the only brace on the market with screws covered and protected from dirt and injury. Complete in one piece, with folding handles, easy to handle, and no cleaning of screws, as is necessary with braces that have exposed screws. Built with the greatest care and accuracy, of the very best material, and fully guaranteed. All parts are interchangeable, longer or shorter barrels may be used, thus adapting it to any width of trench.

STANDARD BRACES

1¼-inch diameter screw, 1½-inch pipe, extension 10 inches

							Per Dozen Complete
16 inches long over all and when closed.....							\$23.00
18 " " " "	"	"	"	"	"	"	24.00
24 " " " "	"	"	"	"	"	"	25.00
30 " " " "	"	"	"	"	"	"	27.00
36 " " " "	"	"	"	"	"	"	28.00

DOUBLE STRENGTH BRACES

1½-inch diameter screw, threaded 15 inches, 2-inch
pine.

	pipe.						Doeen
30 inches long over all and when closed.....							\$50.00
36 " " " " " " " " " " " " " " " " " "	"	"	"	"	"	"	\$1.00
48 " " " " " " " " " " " " " " " " " "	"	"	"	"	"	"	\$3.00
60 " " " " " " " " " " " " " " " " " "	"	"	"	"	"	"	\$5.00
72 " " " " " " " " " " " " " " " " " "	"	"	"	"	"	"	\$7.00

For above with special 1¾-inch diameter screw
and 2½-inch pipe, add \$5.00 dozen.

CONSTRUCTION—Screws are of wrought iron. All other parts, including timber brace caps, are of malleable iron. Each brace is fitted with ball and socket shoe, allowing the brace to take a firm bearing if placed at an angle. Bearing surface of the shoe or foot contains lugs which hold firmly to the plank when the brace is properly tightened.

HOW TO ORDER—Lengths of braces listed are "over-all and when closed." To ascertain length of brace required, take extreme width of cut, deduct amount of planking on both sides of trench (usually about 8 inches) and two or three inches for variations in width of cut, and remainder will give size of brace wanted, closed, the screw being extended to take up the difference and tighten the brace in position.

"UNION" TRENCH BRACES FOR TIMBERS



This is a popular style of brace, which can be used in any width of trench from 2 to 30 feet. It will be found especially valuable in wide and deep trench and foundation work.

All parts are made of the best material. Screws are wrought iron, caps of refined malleable iron.

The shoe is attached to the ball-head of the screw by rod passing through it. This rod is riveted to the shoe. This attachment permits of motion up or down or to either side, allowing the brace to take a firm bearing if placed at an angle.

No.	Diameter of Screw, inches	Length of Screw, inches	Size of Cap or Washer, inches	Approximate Weight, Each	Price per Dozen
70	1 1/4	12	4 x 4	14 lbs.	\$16.50
71	1 1/4	14	4 x 4	15 "	17.00
72	1 1/2	14	4 x 4	18 "	18.00
73	1 1/2	14	6 x 6	22 "	20.00
74	1 1/2	18	6 x 6	25 "	22.00
75	1 3/4	14	6 x 6	26 "	36.00
76	1 3/4	18	6 x 6	29 "	38.00
77	1 3/4	18	8 x 8	32 "	40.00
78	2	18	8 x 8	35 "	52.00

When required, we can also furnish caps for the butt end of the brace. Unless otherwise stated in order, all orders will be filled with the single cap.

REPAIR PARTS



No. 4-Screw



No. 2-Shoe



No. 3-Lever Nut



No. 1-Cap

No. 1 Caps	No. 2 Shoes	No. 3 Lever Nuts	No. 4 Screws
4 x 4.....\$3.00 doz.	1 1/4 screw....\$4.00 doz.	1 1/4 screw...\$12.00 doz.	1 1/4x12..... \$12.00 doz.
6 x 6..... 4.00 "	1 1/2 " 4.00 "	1 1/2 " ... 15.25 "	1 1/4x14 14.50 "
8 x 8..... 7.00 "	1 3/4 " 6.00 "	1 3/4 " ... 17.50 "	1 1/2x14..... 18.50 "
.....	2 " 6.00 "	2 " ... 20.00 "	1 1/2x18..... 22.50 "
.....	.....	.....	1 3/4x14..... 24.00 "
.....	.....	.....	1 3/4x18..... 29.00 "
.....	.....	.....	2 x18..... 36.00 "

When Ordering, give size of screw and also size of cap wanted. We do not furnish timbers. Care should be taken to bore the timbers straight to avoid binding of the screw.

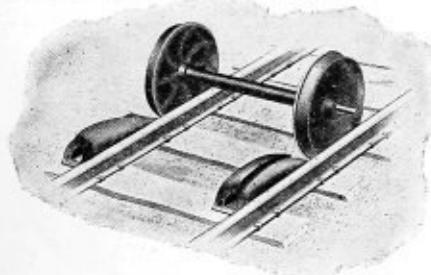
JOHNSON WRECKING FROGS OR CAR REPLACERS



Has three points of contact for support; at small end by rail, at broad end by rail and tie. Straddles the rail and replaces wheels on both sides of rail at one setting. Does not require bolts, clamps, spikes or wedges to hold in place while in operation. Fits all sections of T rail from 6 inches down.

Style	Service	Weight Each, Lbs.	Price per Pair
AAA	Heaviest Engines.....	375	\$62.50
AA	For Tool Car.....	275	50.00
A STD	Standard 100-Ton Frog....	150	27.50
B	70-Ton Car Frog.....	110	22.00
C	Electric Cars and Mines....	85	18.75
S	Street Railways.....	45	15.00
M	{ Open Hearth Steel..... For Rail up to 3 in. High For Mines, etc.....	30	15.00

THE ALDON CAR REPLACERS



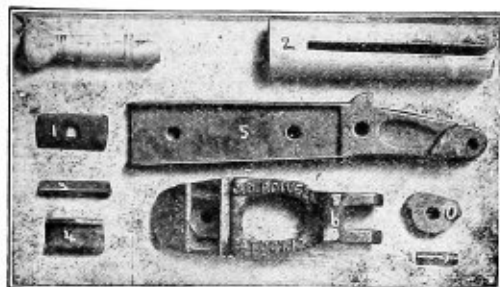
Frogs are marked right and left. The right frog is always placed adjacent to the right rail, the left frog to the left rail. Place the high ends as close to the rail as possible. The wings at the low end of the frogs must never be placed on top the flange of the rail.

No.	Weight per Pair, Lbs.	Material Made Of	Equipment Suitable For	Rail Applicable To	Price per Pair
1	200	Cast Steel	Heaviest	100 lbs. or less	\$20.00
2	180	" "	Modern	80 " "	18.75
3	100	Mall. Iron	{ Electric Suburban }	65 " "	15.00
4	50	" "	Industrial	35 " "	12.50
5	40	" "	Street Railw'y	Flat Rail	12.50

"SAMSON" CAR MOVERS



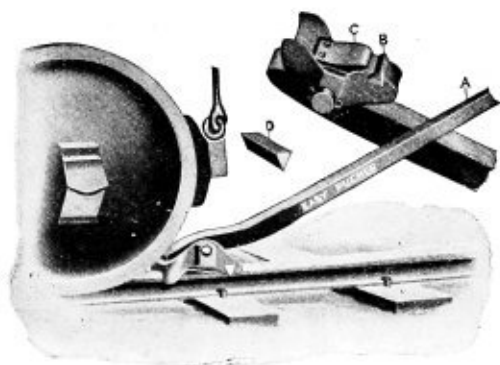
Weight, 15 lbs. Price complete, \$10.00.



Price of extra or repair parts:

No. 0.	Cam, in end of arm 5.....	\$0.20
" 1.	Clamp, to hold spur 3.....	.20
" 2.	Wood Handle.....	1.00
" 3.	Spur, that rests on rail.....	.25
" 4.	Spring, that slides on rail.....	.25
" 5.	Arm, bolted to handle 2.....	1.25
" 6.	Shoe, bolted to arm 5.....	1.25
" 7.	Steel Pin, goes through cam 0.....	.05

"EASY" STEEL CAR PUSHERS



As shown in the cut, the heel has lugs extending downward on both sides of the rail so as to hold it firmly in position and prevent its slipping sideways. The triangular bit or steel cuts into the rail when pressure is applied and prevents slipping backward, even though the rail is icy, greasy or wet. This bit can be inverted. Each one has three sharpened edges. When the pressure is released the steel spring lifts the steel bit from the rail, thus preventing it from being dulled by sliding over the rail when following the wheel. Two triangular steels with each pusher.

The bar "A" is steel; the shoe is malleable; the bit "D" is of the finest tool steel; the spring "C" is also of fine steel. Weight, 20 lbs. Length, 5 1/2 feet.

Price	each, \$10.00
Extra Shoes.....	2.50
Triangular Steels.....	.50

STEEL RAILS



Of All Standard Sections

Weight per Yard, pounds	Tons per Mile, 2240 pounds		Weight per Yard, pounds	Tons per Mile, 2240 pounds	
8	18 Tons	1920 Pounds	45	70 Tons	1620 Pounds
12	25 "	320 "	50	78 "	1280 "
16	31 "	960 "	55	86 "	...
20	39 "	640 "	60	94 "	640 "
25	44 "	...	65	102 "	320 "
30	47 "	320 "	70	110 "	...
35	55 "	...	75	118 "	...
40	62 "	1920 "			

Price per Ton.....Market

Splice Joints Per Mile (2 Bars and 4 Bolts and Nuts to Each Joint)

Rails 20 feet long.....	528 Joints
" 24 " ".....	440 "
" 26 " ".....	406 "
" 28 " ".....	378 "
" 30 " ".....	352 "



"Samson"

"JIM CROW" RAIL BENDER

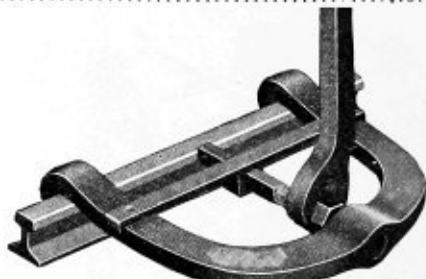
"Jim Crow:" Forged from solid machine steel; machine cut, square thread screws; heavy bracing bar for supporting shaft.

No.	For Rails	Weight Each, pounds	Price Each
1	100 lbs. and lighter	225	\$40.00
2	75 " " "	180	30.00
3	56 " " "	110	25.00
4	30 " " "	80	20.00
5	20 " " "	60	15.00

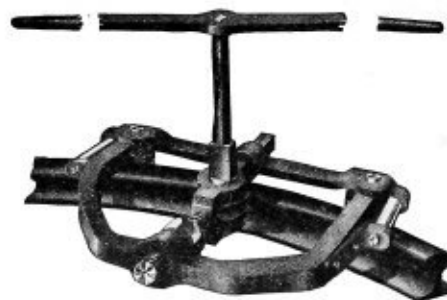
"SAMSON" RAIL BENDERS

"Samson:" Will bend 100 pound rails into position when taking kinks out of track without drawing spikes. Can be operated by one man. Frame is of Open Hearth steel made extra strong. Screws are of steel, working in bronze nut and provided with anti-friction washers. Thrust is of hardened steel.

Weight Each, pounds.....100
Price Each.....\$75.00



"Jim Crow"



"Roller"

ROLLER RAIL BENDERS AND STRAIGHTENERS

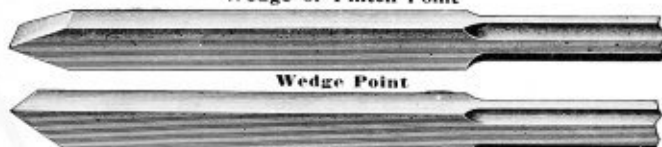
Place bender over rail as shown in cut, turn up nut on center screw until set for desired curve, then place socket wrench on pin in center roller, put long lever on top of socket, and then one or more men can turn center roller, which causes the bender to move forward on rail, bending same as it moves. To straighten rails, place bender on opposite side of curve and operate as above.

No.	For Rail Suitable	Weight Each, pounds	Price Each
1	20 to 40 lbs.	300	\$105.00
2	41 " 60 "	360	115.00
3	61 " 70 "	400	140.00
4	71 " 80 "	470	180.00
5	81 " 90 "	520	230.00
6	91 " 100 "	830	400.00

SOLID STEEL BARS

CROW BARS

Wedge or Pintch Point



Wedge Point

Pintch Point

Length, feet	Weight Each, pounds	Price, per pound	Length, feet	Weight Each, pounds	Price, per pound
4	12	\$0.12	5½	20	\$0.12
4½	15	.12	6	24	.12
5	18	.12	7	40	.12

LINING BARS

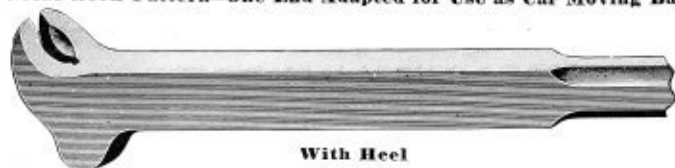


Length.....feet, 6½ Weight.....pounds, 30 Price.....per pound, \$0.15

CLAW BARS



Goose Neck Pattern—One End Adapted for Use as Car Moving Bar



With Heel

CLAW BARS, GOOSE NECK			CLAW BARS, WITH HEEL		
Length, feet	Weight, pounds	Price, per pound	Length, feet	Weight, pounds	Price, per pound
5	28	\$0.18	5½	28 to 30	\$0.18

RAILROAD TAMPING BARS

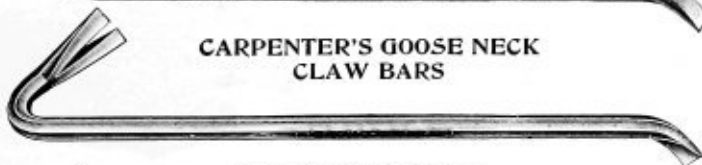


Length.....feet, 6 Weight.....pounds, 14 Price.....per pound, \$0.16

CARPENTER'S CLAW BARS



CARPENTER'S GOOSE NECK CLAW BARS



BABY PINTCH BARS



CARPENTER'S CLAW BARS				CARPENTER'S GOOSE NECK BARS				BABY PINTCH BARS			
No.	Size, inches	Price Each	Price per Dz.	No.	Size, inches	Price Each	Price per Dz.	No.	Size, inches	Price Each	Price per Dz.
103	¾x24	\$0.75	\$7.50	104	¾x26	\$1.15	\$11.50	25	¾x30	\$1.45	\$14.40
104	¾x26	1.15	11.50	105	¾x36	1.30	18.00	26	¾x36	1.70	17.00
105	¾x36	1.80	18.00								

TRACK DRILLING MACHINES



"Climax"



"Paulus"



"Moore"

CLIMAX TRACK DRILL—Automatic feed; has offset permitting drilling to end of rail, and also adapts the machine to close work on crossings. Hooks can be quickly extended to reach over guard rails or a "Webber" joint. Every bearing is bushed; gears are cut of finest crucible steel; hooks are solid steel forgings, with set screw adjustment automatically centering drill. Balance of drill is made of Bessemer steel and finest malleable iron; will collapse to allow passage of train without disturbing drill. The Climax is the most durable drill on the market.

Price, complete with one bit.....\$25.00

PAULUS TRACK DRILL—A standard type; automatic feed; will collapse to allow passage of train without disturbing drill.

Price, with one drill bit.....\$25.00

MOORE TRACK DRILL—Built in two sizes with detachable upright; upright can be collapsed to allow passage of trains without disturbing hooks or drill. Has automatic feed, variable from 1 inch in 50 to 1 inch in 650 revolutions of spindle.

No. 1 for drilling holes up to 1 inch\$25.00

No. 2 for drilling holes up to 1½ inch 35.00

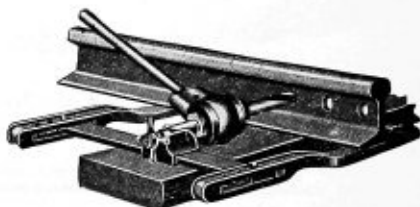
One bit furnished with each drill.

"BELAND" RATCHET RAIL DRILLS



Price, complete.....\$7.50
Drill Bits, each55
Ratchet, each..... 5.50

SCHUTTLER RAIL DRILL



This drill works continuously, the movement of the lever in either direction causing a continuous and uniform rotation of the drill point in one direction.

Each\$16.00

HIGH SPEED TRACK DRILLS are listed fully elsewhere in this book. (See Index.)

TAMPERS

Correct Designs. Best Material and Workmanship



Style No. 1
Steel Plate



Style No. 2
Cast Plate



Style No. 3
Cast Plate



Combination
Curb

Style	Size of Base, inches	WOOD HANDLED			PIPE HANDLED		
		Weight Finished, lbs.	PRICE		Weight Finished, lbs.	PRICE	
			Each	Dozen		Each	Dozen
1	8x8	13	\$2.00	\$20.00	15	\$2.20	\$22.00
1	10x10	16	2.20	22.00	20	2.40	24.00
1	12x12	26	2.40	24.00	30	2.70	27.00
2	5x6	9	1.20	12.00	11	1.50	15.00
2	6x7	13	1.40	14.00	15	1.60	16.00
2	7x8	14	1.50	15.00	16	1.70	17.00
2	8x8	15	1.60	16.00	17	1.80	18.00
2	10x10	20	1.80	18.00	22	2.00	20.00
2	5x6	24	2.20	22.00	25	2.40	24.00
3	7 inch Diam. Rod	20	2.30	23.00	22	2.50	25.00
Curb	1x3 1/2	3	.95	9.00	5	1.15	11.00
Curb	4x4	5 1/2	1.20	12.00	7 1/2	1.40	14.00
Curb	3 1/2 x 6	6 1/2	1.25	12.50	7 1/2	1.50	15.00
Combination } Curb }	1x3 1/2 } On one 4x4 } Handle	8 1/2	2.15	21.00	12	2.50	25.00

CHANNON-HUNTINGTON TRACK GAUGES



No. 65—Standard gauge 4 ft. 8 1/2 in., weight 140 lbs. to dozen. Price each.....\$1.75
No. 67—With guard rail attachment. Price each 2.00

No. 70 WOOD TRACK LEVELS



White pine with three coats of paint, bound with steel. Price each.....\$2.00

No. 75 COMBINED TRACK GAUGE AND LEVEL



Has gauge glass in rubber packing.
Price each.....\$3.50

TRACK TOOLS

Best Crucible Tool Steel, Oil Finished Hardened and Tempered



Mauls



Chisels



Punches

Weight, pounds	PRICE PER POUND		
	Mauls	Chisels	Punches
4			\$0.40
4 1/2			.40
4 3/4			.40
5			.40
6	\$0.40		
8	.40		
10	.40		
12	.40		



RAILROAD
TRACK
TONGS

Weight per pair 17 lbs.
Price per lb.\$0.30



RAIL FORKS

Weight each, 15 lbs.
Price per lb., \$0.25

CHANNON'S BRIDGE-BUILDERS' AND STRUCTURAL STEEL ERECTORS' SPECIAL TOOLS

"Sterling" Brand, Forged from High Grade Tool Steel
RIVETING, FLOGGING AND NAPPING HAMMERS



Fig. 100



Fig. 101



Fig. 102

No.	Description	Weight, Pounds	Face, inches	Length, inches	Price Each
100	Riveting	4	1½ and 1¾	8½	\$2.00
101	Flogging	7	1¾	7	2.50
102	Napping	3	1¾	6	2.00

CUTTING TOOLS



No. 95



No. 96



No. 97



No. 98



No. 99

No.	Name and Description	Weight, Pounds	Face or Bit, inches	Length, inches	Price Each
95	Rivet "Buster"	5½	1½ Square	6	\$1.20
96	Straight Blade Cold Cutter		1½	6½	1.20
97	Cross Blade Cold Cutter		1½	6½	1.20
98	Side Set, or Cutter		1½	6½	1.20
99	Handle Gouge		1½	6½	1.20

Handle Gouges furnished ½ or ¾-inch and with round nose or diamond point, as desired, at same list prices.

RIVETING DOLLIES



FIG. 108



FIG. 110



FIG. 109

FIG. 112

Fig. 108—Straight Dolly.....\$3.50
109—Club Dolly.....4.30

Fig. 110—Spring Dolly.....\$6.50
112—Heel Dolly.....6.00



Fig. 106

HALF-ROUND REAMERS

Length, 8 inches

For ½, ¾, 1 and ¾ rivets.....each, \$1.25

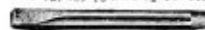


Fig. 107

HAND GOUGE

Length, 8 inches, ¾-inch material.

For ½, ¾ and ¾ rivets.....each, \$0.85



HAND CHISELS

Length 8 inches, ¾ material.

Flat, cape, dia. point or round nose.....each, \$0.75

SPECIAL RIVET TONGS



Fig. 103

Pick-up Tongs, 18-inch.....pair, \$1.00
Heating " 20- " " " 1.00



Fig. 104

SPECIAL RIVETING CLAMP

For Bridge Builders and Contractors

Hand made from best materials.

Price each.....\$0.00

Handles for Above Tools are Extra and are Listed Elsewhere



Fig. 92

RIVET "SNAPS" OR "SETS"

For Button Head or Conical Head Rivets

Unless specified we send snaps for button head rivets.

Rivet Size.....	¾	1	1½	2	2½	3
Weight, Lbs.....	3	3	3½	4	4	4½
Price Each.....	\$1.80	1.80	1.90	2.00	2.25	2.50

"DRIFT" PINS—BARREL SHAPED



Fig. 93

Average length about 7 inches.

Size of Pins.....	7/8	1	1½	2	2½	3
Rivet Size.....	¾	1	1½	2	2½	3
Weight, Oz.....	8	8	12	14	16	20
Price Each.....	\$0.25	.25	.25	.30	.35	.50



Fig. 94

"BACKING-OUT" PUNCHES

Weight, about 3½ lbs.

Price each.....\$1.50

Rivet Sizes.....	¾	1	1½	2	2½	3
Length, inches.....	6	6	6½	7	7½	8

Fitting-up Wrenches, see index.

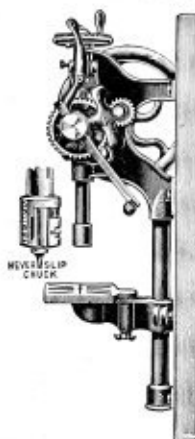
"CHAMPION" BLACKSMITHS' POST DRILLS



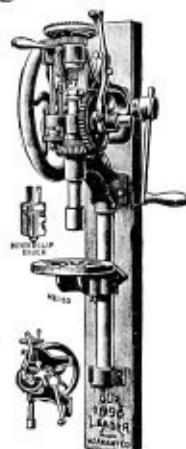
No. 92



No. 93



No. 93



No. 96

Quick Return

- No. 92. Has hand feed without fly-wheel or back gearing.
 No. 93. Full back gear and two speeds; bearings ground from solid metal and polished. Crank turns in same direction on both speeds.
 No. 96. Three gears, two speeds; crank turns in same direction on both speeds. Has back gears with double journal bearings ground from solid metal. Quick return is accomplished by an automatic lever.
 No. 98. One speed; back geared; slotted, lathe turned table.

No.	Drilling Circle, inches	Diameter Spindle, inches	Up and Down Run, inches	Bored for S. S. Bits, Size, inches	Drills Holes, Size, inches	Weight, Pounds	Price Each	Extra for Power
92	12	$\frac{7}{8}$	3	$\frac{1}{2}$	To $\frac{3}{4}$	65	\$ 6.00	.....
93	15	$1\frac{1}{8}$	3	$\frac{1}{2}$	To $1\frac{1}{4}$	125	10.00	\$3.00
96	$15\frac{1}{2}$	$1\frac{1}{8}$	3	$\frac{1}{2}$	To $1\frac{1}{4}$	135	12.50	3.00
98	14	1	3	$\frac{1}{2}$	To 1	95	8.00	3.00

Will be bored for $\frac{1}{4}$ inch S. S. Bits if specially ordered.

THE CHAMPION No. 7 IMPROVED CUT GEARED SELF-FEED POST DRILL



No. 7. Champion Improved Self-Feed Drill has **cut gears** ball bearings and double back gears. It has rack for raising and lowering the table and wheel hanger. Drills to center of 21-inch circle. Spindle has up-and-down run of $5\frac{1}{2}$ inches. Bored for $\frac{1}{4}$ -inch straight shank bits, if specially ordered, bored for $\frac{1}{2}$ -inch. Drills holes up to $1\frac{1}{2}$ inches.

Length, 65 inches.

Weight, 400 lbs.

Price, hand power only...\$40.00

With pulleys 44.00

THE CHAMPION BALL BEARING BLACK DIAMOND SELF-FEED POST DRILL

The Champion Ball-Bearing Black Diamond Self-Feed Post Drill is built on scientific principles. Has two fly-wheels and wheel hanger. Drills to center of 18-inch circle. Spindle has an up-and-down run of $4\frac{1}{2}$ inches. Bored for $\frac{1}{2}$ -inch straight shank bits, if specially ordered, bored for $\frac{1}{4}$ -inch. Drills holes up to $1\frac{1}{2}$ inches.

Price, without wheel hanger or ball bearings, w.t.

250 lbs.\$20.00

Extra for power 4.00

Price, complete, w.t. 255

lbs. 24.00

Extra for power 4.00



WESTERN CHIEF BLACKSMITHS' POST DRILLS



No. 7



No. 16



No. 17

No. 7

This drill is a hand and power drill with cut gears. Has automatic self-feed, and fast and slow speed, which can be changed instantly. Size of tight and loose pulleys for power, $10\frac{3}{4} \times 2\frac{1}{2}$ inches. Drills should be operated at about 175 revolutions per minute.

No. 16

This drill is a ball-bearing drill with power attachment, hand-lever feed and horizontal, gear-driven positive self-feed. Each feed works independently of the other. Has cut gears and rack for raising and lowering table. Size of tight and loose pulleys $10\frac{3}{4} \times 2\frac{1}{2}$ inches. Drills should be run at 175 revolutions per minute.

No. 17

This drill is a finished floor drill for hand or power. It has straight and beveled cut gears; hand lever-feed, also horizontal gear-driven positive self-feed. Each feed works independently of the other. Has two speeds which can be changed instantly and rack for raising and lowering table. Size of tight and loose pulleys $10\frac{3}{4} \times 2\frac{1}{2}$ inches. Drill occupies floor space of 15×26 inches. Should be run at 175 to 180 revolutions per minute.

No.	Drilling Circle, inches	Up and down run of Table, inches	Up and down run of Spindle, inches	Bored for S. S. Drills, inches	Drills Holes size, inches	WEIGHT, POUNDS		Price with T. & L. Pulleys
						Hand	Power	
7	21	$16\frac{1}{2}$	5	$\frac{1}{2}$ - $\frac{3}{4}$	0 to $1\frac{1}{2}$	275	295	\$37.50
16	24	$15\frac{1}{2}$	$8\frac{1}{2}$	$\frac{1}{2}$ - $\frac{3}{4}$	0 to $1\frac{1}{2}$	340	360	46.50
17	24	$15\frac{1}{2}$	$8\frac{1}{2}$	$\frac{1}{2}$ - $\frac{3}{4}$	0 to $1\frac{1}{2}$	560	560	65.00

No. 7. Without pulleys, for hand power only..... \$33.50

No. 16. Without pulleys, for hand power only..... 46.50

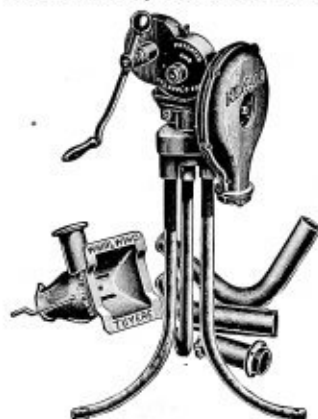
Special wheel holder attachment, extra..... 2.00

In ordering always state whether spindle is wanted bored for $\frac{1}{2}$ or $\frac{3}{4}$ straight shank drills.

For Machine Shop Drill Presses (See Index)

No. 400 SERIES CHAMPION STEEL BLACKSMITH BLOWERS

Made with Adjustable Ball Bearings only. High-Speed Spiral Gearing. Will Produce White Heat Blast



No. 400 Hand Power Only

Equal in every respect to a blast produced from a blower run by power. Machinery is all made from best tool steel and phosphor bronze, machined and cut from solid metal, and fitted with the precision and nicety of a watch, all enclosed in an oil-tight casing. It has no belts or friction, and is fitted up all through with ball bearings. The blower is very compact; can be taken apart for transportation and again set up in a very few moments. It has an adjustment whereby it can be raised or lowered to suit the height of all size mechanics. The blast is produced by turning the crank either direction.

HAND BLOWERS

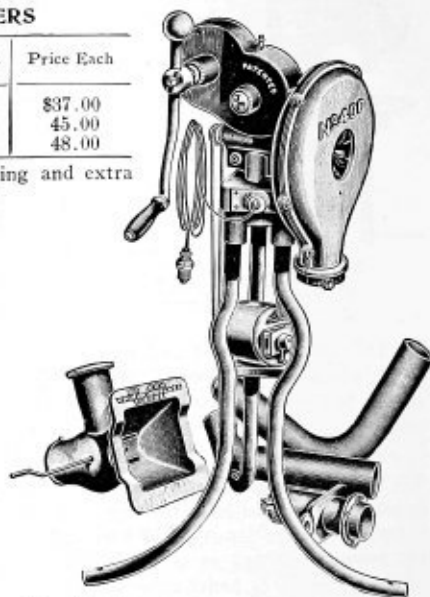
No.	Diam. Fan, inches	Weight, lbs.	Price Each
400	12	100	\$37.00
420	14	145	45.00
421	16	150	48.00

Prices complete with piping and extra heavy tuyere iron.

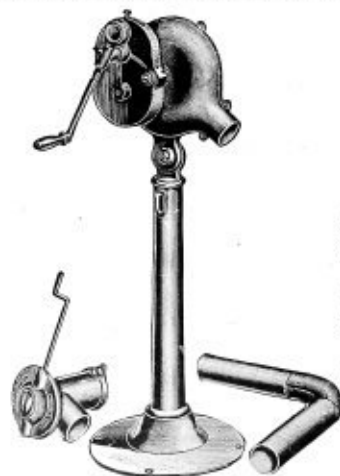
CHAMPION ELECTRIC AND HAND POWER BLACKSMITH BLOWER

Before ordering ascertain if you have direct or alternating current, what cycle, phase and voltage. The motor must be connected to its proper current, cycle, phase and voltage or it will burn out.

No. 400 Champion Electric and Hand Power Blacksmith Blower, for either direct or alternating current, with any voltages, fan 12-inch in diameter, with "Whirlwind" Blast anti-clinker heavy nest tuyere iron piping, blast gate complete. Weight 225 lbs.....\$75.00



No. 400 Electric; Complete with Motor



Lancaster Geared Blower

LANCASTER GEARED BLACKSMITH BLOWER

The Champion Lancaster Geared Blower is a well built, direct driven blacksmith Blower, which has been designed to meet the demand for a lower priced blacksmith blower than the 400 Champion Blower.

This Blower is supplied with the Champion Adjustable Nozzle Tuyere Iron, it is smooth running, crank turns either way to make the blast. Every blower goes out with our recommendation.

The Champion Lancaster Geared Direct Driven Blacksmith Blower, with Fan 12-in. in Diameter, Tuyere Iron and Piping complete. Weight 110 lbs.

Price..... \$20.00

FORGES

The 400 series of forges are equipped with 400 Champion Blowers. The 400 Champion Steel Blower is equal to a power blower and will produce a white heat blast, which cannot be obtained with the regular hand power blower. They are supplied with the highest possible grade of adjustable ball bearings that can be manufactured. With cups and cones, lathe-turned from the solid steel bar, hardened as hard as glass, ground and polished to the highest finish, making them perfect and durable high-speed adjustable bearings.



No. 401
The
Popular
Number

THE CHAMPION STEEL RIVET FORGE

Made with Adjustable Ball Bearings Only

This forge is adapted for elevated and steam railroads, bridge and tank builders, miners and prospectors, boiler repairers, or any portable work requiring compactness and lightness, with a strong blast. If necessary it will produce blast to weld $3\frac{1}{2}$ to 4-inch iron in ten minutes. The crank to produce the blast can be turned either way.

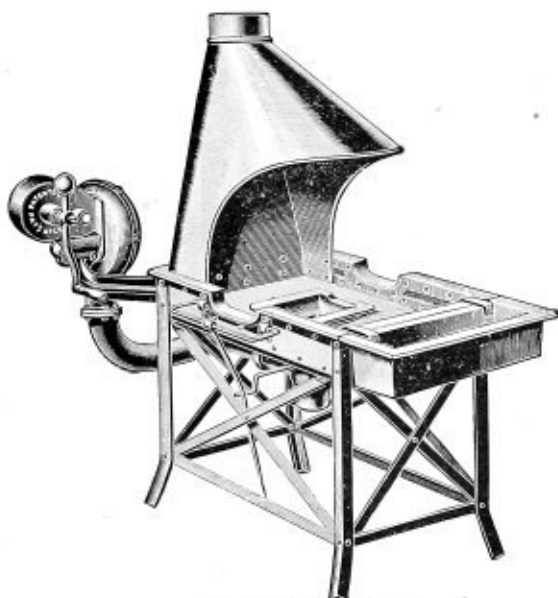
No.	Style, Forge	Diameter Hearth, inches	Diameter Fan, inches	Height Forge, inches	Weight, pounds	Price, Each
401	With shield...	18	9	30	90	\$35.00
402	With half hood	18	9	30	90	38.00
403	Closed hood...	18	9	30	100	40.00
401½	With shield....	22	9	30	100	40.00
402½	Half hood.....	22	9	30	105	43.00

The 401 Rivet Forge is especially favored by structural iron workers.

THE CHAMPION STEEL HORSESHOERS' AND BLACKSMITHS' FORGE

Made with Adjustable Ball Bearings Only

A most practical and complete up-to-date Horseshoers' and Blacksmiths' Forge. It is built from heavy structural steel and heavy steel plate with perpendicular sides six inches wide, making the hearth six inches deep, and is supplied with the No. 400 Champion "Whirlwind" Blast, Anti-Clinker, Heavy Nest, Tuyere Irons without extra cost. We recommend these Forges as being substantial and as firm for a general blacksmith hearth as any hearth that a blacksmith can build. The crank turns either direction to make the blast. It will make a white heat blast, guaranteed equal to the best power blower blast. It runs noiseless, smooth, easy and pleasant to the hand, and will always continue to do so. Its parts are all machine-cut from the very highest grade of tool steel and phosphor bronze. Its Ball Bearings are all adjustable and the finest that can be manufactured. While these Forges have been designed and built to meet the demand for a practical Horseshoers' Forge, it is also practical for carriage and heavy wagon work, railroad shops, general blacksmithing or any other demand for heavy work it may be called upon to perform.



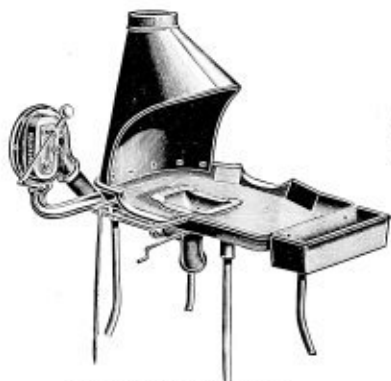
No. 409. With Half Hood.

No.	Style	Hearth inches	Diameter Fan, inches	Height inches	Weight pounds	Price, Each
404	Shield	24 x 24	9	30	110	\$45.00
405	Half hood.	24 x 24	9	30	120	49.00
406	Shield	30 x 30	10	30	160	55.00
407	Half hood.	30 x 30	10	30	175	60.00
408	Half hood.	30 x 36	12	30	225	65.00
409	Half hood.	30 x 40	12	30	250	70.00

For Forge with Water Tank, add \$5.00 to above list prices.

CHANNON "MIDWAY" SPIRAL GEARED FORGES WITH CAST IRON HEARTH

These Champion "Midway" Spiral-Geared Forges have cast iron hearths and are supplied with "Midway" or Cross Spiral Gearing. A good, strong and durable Forge, which will give the best of satisfaction, where a less expensive forge than the 400 series is wanted.



No. 71 with Half Hood



No. 73 with Half Hood



No. 75 with Shield

No.	Style	Hearth, inches	Fan, inches	Height, inches	Weight, lbs.	Price, Each
71	Half Hood.....	32 x 45	12	30	300	\$50.00
72	Shield.....	23 x 35	10	30	185	36.00
73	Half Hood.....	23 x 35	10	30	190	40.00
75	Shield.....	22 Dia.	10	33	140	30.00
76	Half Hood.....	22 Dia.	10	33	145	33.00

If water tank is wanted with No. 71, add \$5.00 to list above.

RATCHET LEVER FORGES

Made with double ratchet, strong and substantial, used by bridge, boiler and tank builders, miners, prospectors, farmers, etc. Guaranteed first-class in every respect.

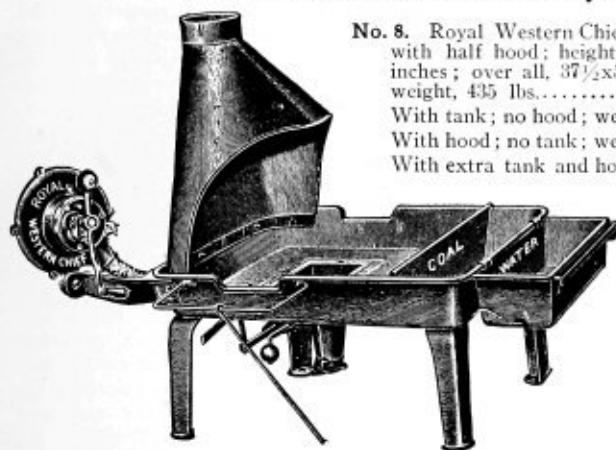
No. 55
With
ShieldNo. 59
With
Half
HoodNo. 61
With
Half
Hood
and
Water
Tank

No.	Style of Forge	Hearth, inches	Height, inches	Dis. of Fan, inches	Weight, lbs.	Price, Each
55	Shield.....	18	30	8	75	\$24.00
56	With Half Hood.....	18	30	8	75	27.00
58	Has Shield.....	21x27	29	10	130	36.00
59	With Half Hood.....	21x27	29	10	140	40.00
*61	With Half Hood.....	28x40	30	14	250	50.00
61	With Half Hood and Tank.....	28x40	30	14	255	55.00

*No. 61 is provided with Improved, Revolving Anti-Clinker Ball Tuyere Iron for regulating the blast.

ROYAL (WESTERN CHIEF) FORGES

With Cast Iron Hearth--For Extra Heavy Work--With Hand Blower



- No. 8. Royal Western Chief Forge.** For heavy blacksmith work; with half hood; height, 26 inches; cast iron hearth $37\frac{1}{2} \times 41$ inches; over all, $37\frac{1}{2} \times 51$ inches, plain; no tank; no hood; weight, 435 lbs. **\$65.00**
 With tank; no hood; weight, 500 lbs. **70.00**
 With hood; no tank; weight, 450 lbs. **70.00**
 With extra tank and hood; weight, 515 lbs. **75.00**

- No. 9. Royal Western Chief Forge.** For large plow shops; with half hood; height, 26 inches; cast iron hearth 38×50 inches; over all, 38×60 inches; fan, 12 inches; plain; no tank; no hood; weight, 500 lbs. **\$70.00**
 With tank; no hood; weight, 565 lbs. **75.00**
 With hood; no tank; weight, 515 lbs. **75.00**
 With tank and hood; weight, 580 lbs. **80.00**

STATIONARY BLAST FORGES

These Forges are intended for shops supplied with power blast, or can be used with ordinary bellows or blower, if desired. Equipped with Solid Fire-Pot, side and center blast Tuyere Ball, Tool Rests and Racks, and Lever Attachment to blast Gate, by which the smith easily regulates the blast. They are built for heavy work and are much superior to a brick forge.

No.	Style	Size Hearth, inches	Height, inches	Length Over all, inches	W'ght. lbs.	Price Each
A A	One Tank Only; No Hood.....	$31\frac{1}{2} \times 45\frac{1}{2}$	30	53	220	\$ 25.00
A A	Extra Tank; No Hood.....	$31\frac{1}{2} \times 45\frac{1}{2}$	30	53	250	30.00
A A	One Tank and Half Hood.....	$31\frac{1}{2} \times 45\frac{1}{2}$	30	53	235	30.00
A A	Extra Tank and Half Hood.....	$31\frac{1}{2} \times 45\frac{1}{2}$	30	53	265	35.00
B B	No Tank; No Hood.....	$37\frac{1}{2} \times 41$	26	51	375	35.00
B B	Tank; No Hood.....	$37\frac{1}{2} \times 41$	26	51	440	40.00
B B	Hood; No Tank.....	$37\frac{1}{2} \times 41$	26	51	390	40.00
B B	Tank and Hood.....	$37\frac{1}{2} \times 41$	26	51	455	45.00
X B B	No Tank; No Hood.....	38 x 50	26	60	440	40.00
X B B	Tank; No Hood.....	38 x 50	26	60	505	45.00
X B B	Hood; No Tank.....	38 x 50	26	60	455	45.00
X B B	Tank and Hood.....	38 x 50	26	60	520	50.00



CHAMPION ELECTRIC DRIVEN BLACKSMITH STEEL FORGE

Blowers for use with these forges and conditions concerning their use, shown in another part of this book. (See index.)

- No. 440. Champion Electric Driven Blacksmith Steel Forge,** with "Whirlwind" Blast Anti-Clinker Heavy Nest Tuyere Iron, hearth, 30×36 inches; height, 30 inches; with hood complete; weight, 300 lbs. **\$67.00**
No. 441. Champion Electric Driven Blacksmith Cast Iron Forge, with "Whirlwind" Blast Anti-Clinker Heavy Nest Tuyere Iron; hearth, 32×45 inches; height, 30 inches; with hood complete; weight, 360 lbs. **\$60.00**

AGRICULTURAL LEVER FORGE

For all kinds of light repair work. Especially serviceable on the farm.



No.	Style Forge	Hearth, inches	Fan, inches	Wt., lbs.	Price Each
50	With Shield.....	18	8	65	\$14.00
51	" Half Hood.....	18	8	70	16.00

THE STAR PORTABLE BELLOWS FORGE

A forge very popular with bridge builders; simple in construction, easily operated, has no gears or belts.



No.	Hearth, inches	Height, inches	Weight, pounds	Price Each
40	19	30	100	\$40.00

THE GUNNELL PNEUMATIC FORGE



Hollow cylinder above fire contains fuel which descends in a highly heated condition and feeds it. Cylinder and funnel arrangement maintains a steady and easily regulated air supply.

Upper part of forge is pivoted, so any rivet can be reached by simply revolving fire bed. Does not burn rivets and will easily heat 200 per hour. Has a constant fuel feed, consumes only 2 feet of air per minute and burns a small amount of fuel per day. It heats 20 rivets at once. Uses small pea coal, hard coal or coke screenings.

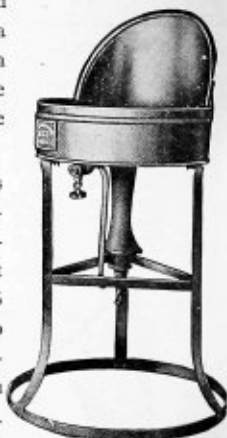
Weight.....50 pounds

Price.....\$25.00

BUFFALO COMPRESSED AIR FORGE

The feature is a compound injector which transforms a small amount of air at a high pressure into a large volume at the right pressure for a fire.

Once the needle valve is adjusted no further regulation is required. Will operate with equal economy at any pressure between 15 pounds and 100 pounds. No tiring arm motion to produce the blast and both hands are free for work. Steel plate construction with three angle legs encircled by a ring base give a firmness recommending the forge for scaffold work.



No. 22 C

No.	Height, inches	FIRE PAN		Weight	Price Each
		Depth, in.	Diam., in.		
22 C	32	6	18	40	\$20.00
22 AC	32	7	22	47	23.00
22 BA	32	7	24	50	26.00

SQUARE STATIONARY DOWN-DRAFT FORGES

For Steam Hammer Work in R. R. Shops and Other Large Forge Works



Down-Draft Forge No. OD

Made of cast-iron, furnished with blast gate, cast-iron anti-clinker dumping tuyere and patent down-draft smoke exhaust hood. Heavy work is suspended above forge.

No.	Height to Top of Fire Pan, inches	Size Fire Pan, inches	Depth Fire Pit, inches	Weight, lbs.	Price
OD	24	42 x 42	12	1,070	\$125.00
ODB	24	42 x 42	12	1,110	130.00
R. R.	24	48 x 48	12	1,440	170.00
R. R. 1'	24	54 x 54	12	1,670	200.00

On the R. R. and R. R. 1 forges (for R. R. repair shops) the hood is adjusted to the fire by means of worm and gear attachment, while within the hood a damper is placed so that the exhaust may be partially or wholly shut off when the forge is not in use.

ROUND STATIONARY DOWN-DRAFT FORGES

Steel Plate Construction

These forges are built of heavy steel plate with a heavy cast-iron patent down-draft smoke exhaust hood, an anti-clinker dumping tuyere and a blast gate.



No. 07 Forge without Tank

No.	Height Fire Pan, inches	Size Fire Pan, inches	Size Coal Box	Size Water Tank	Weight, lbs.	Price
07	26	36	None	None	330	\$ 65.00
07T	26	36	15½x10x15	18½x10x15	410	90.00
07C	26	36	15½x10x15	18½x10x15	530	100.00
08	26	48	None	None	555	85.00
08T	26	48	20x13x18	25x13x18	680	110.00
08C	26	48	20x13x18	25x13x18	865	125.00
0F	26	60	None	None	840	160.00
0H	26	24½x47½	47½x14x10	48x6x10	596	135.00

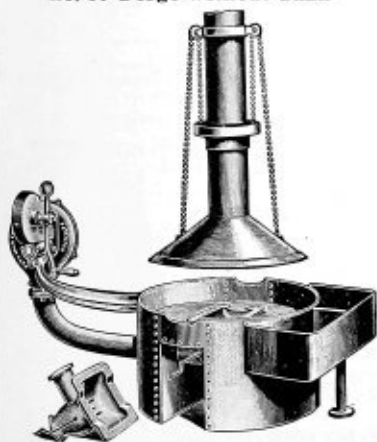
"T" after a number indicates with steel plate coal box and water tank, "C" indicates cast-iron tanks.

Smaller sizes and other styles of down-draft forges upon request.

CHAMPION STEEL FORGE

No. 410

Made with Adjustable Ball Bearings Only

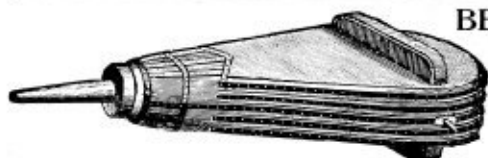


No. 410 with Telescopic Canopy Hood

Size of hearth 36 inches in diameter. Fan 12 inches in diameter.

No. 410 Champion Steel Forge, hearth 36 inches in diameter, height 30 inches, fan 12 inches in diameter, with No. 400 Champion "Whirlwind" blast anti-clinker heavy nest tuyere iron. Weight 500 lbs. With telescopic canopy hood, water tank and coal box, complete\$100.00

H.Channon Company.Chicago.



Blacksmiths' Standard Pattern

Blacksmith Bellows: Made of thoroughly seasoned lumber covered with substantial split cowhide leather; made in two patterns, Standard and Extra Long. The Extra Long pattern is furnished in "Regular" grade (split cowhide leather) or "Special" grade (fine quality grain cowhide or kid).

Hand Bellows: Made of thoroughly seasoned hardwood; covering is high grade split cowhide leather.

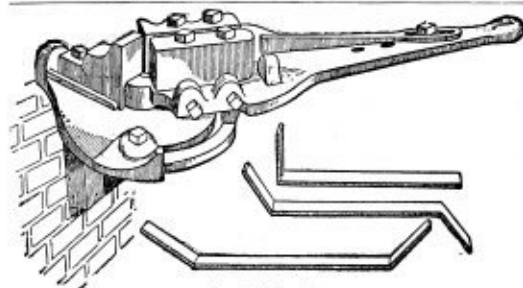
BLACKSMITH

Width, inches	PRICE EACH		Width, inches	PRICE EACH	
	Standard	Extra Long		Standard	Extra Long
24	\$10.00	\$12.00	38	\$20.00	\$24.00
26	11.00	13.00	40	23.00	28.00
28	12.00	14.00	42	27.00	34.00
30	13.00	15.00	44	32.00	40.00
32	14.00	17.00	46	.....	45.00
34	16.00	19.00	48	.....	50.00
36	18.00	21.00	50	.....	60.00

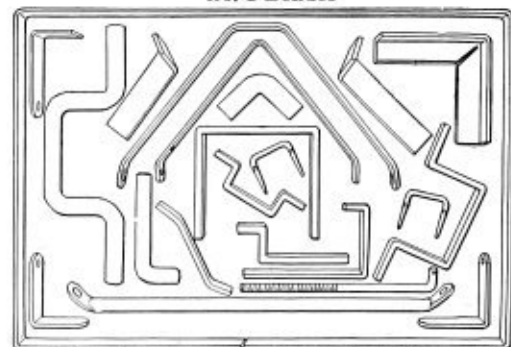
Both Grades of Extra Long Take Same List Prices

HAND

Width, inches	PRICE PER DOZEN			Width, inches	PRICE PER DOZEN		
	Standard	Molders'	Miners'		Standard	Molders'	Miners'
6	\$10.00	.....	.....	14	.....	\$24.00	....
7	11.00	.....	.....	24	.....	.....	.....
8	12.00	.....	.....	26	.....	.....	\$5.00
9	13.00	.....	.....	28	.....	.....	5.75
10	15.00	\$15.00	.....	30	.....	.....	6.50
12	.....	18.00	.....	....	.....	.....	7.25



No. 1 Bender



Samples of Work Done by Angle Bender No. 2

HAND POWER ANGLE BENDERS

Made in two sizes, No. 1 for light and No. 2 for heavy work. These machines can be set with great ease and rapidity to take different sizes of stock and to bend angles of different degrees. The No. 2 machine will bend stock up to 3/8-in. x 1 1/2-in., edgewise, and will bend a very wide range of sizes.

No.	Will Bend Flat Stock, inches	Will Bend Round or Square Stock, inches	Price Each
1	To 3/8x2	To 3/4	\$20.00
2	To 1/2x4	To 1	35.00

EXTRA DIES

No. 1

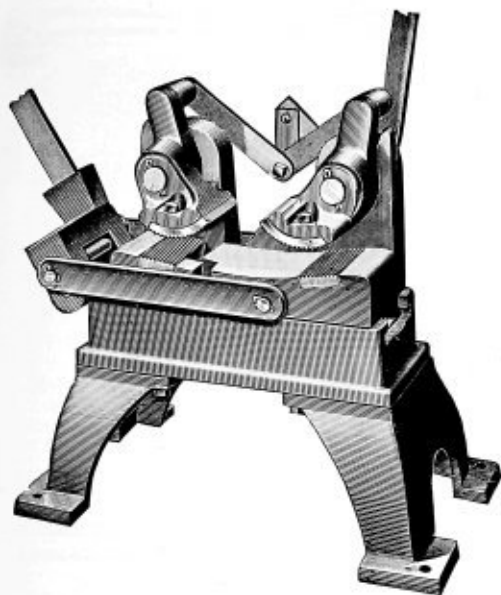
Set of dies for light edge bending \$2.00
Extra dies for odd angles, each 1.50

No. 2

Extra for edge bending die \$2.00
Extra die for angle iron bending 1.00
Extra stationary die 1.50
Extra back die 1.50
Extra front die, any angle 1.00

The No. 2 Bender is same design as No. 1 shown in cut.

WESTERN CHIEF TIRE AND AXLE SHRINKER, No. 1



A strong machine, with capacity to shrink from smallest to 4 by 1-inch round-edge tires, and 1¼-inch square axles. The jaws are 4½ inches wide, and by means of a lever movement with universal joints they grip independently of each other, thereby adjusting themselves to uneven thicknesses, and with but one motion of the lever. The bed has an open-and-shut or shrinking movement of 1½ inches. Ample space and strength is provided for pounding out bulges in tires. The jaw teeth are machine-cut Tool Steel properly hardened.

Weight, pounds.....360

Price, each.....\$40.00

IMPROVED MOLE TIRE SHRINKERS

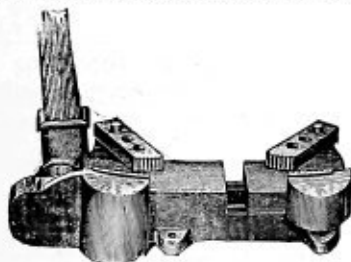


No. 1. For tire up to 2½ inches wide, each...\$16.00

No. 2. For tire up to 3 inches wide, each... 21.00

No. 3. For tire up to 4 inches wide, each... 25.00

CHAMPION TIRE AND AXLE SHRINKERS



The Champion Tire Shrinker, weight 140 lbs., will shrink tire 4x1 inch, will shrink axles 1¼x1¼ inches, floor space 18x10 inches.

Price, each.....\$12.00

No. 1 TIRE BENDERS



Made with turned rollers and bearings; will bend tires up to 3¼ inches to a circle 30 inches diameter or larger.

Price, including Crank, each.....\$6.00

Nos. 2 AND 2½ TIRE BENDERS



Has steel gear and pinion, turned steel rollers and bearings; will bend to a circle 30 inches diameter or larger.

No.	Capacity	Price Each
2	Tires 3¼ inches or smaller.....	\$7.00
2½	Tires 6 inches or smaller.....	8.50

BELLOWS TUYERE IRONS



WARREN'S PATENT

Blast is regulated by revolving a ball, which has three unequal sides. Open bottom valve and

all cinders and ashes drop out. Weight about 31 lbs. Each.....\$2.20



NORTON'S PATENT

To regulate turn large rod. Levers and springs can be easily changed for right or

left hand use. Draw out small rod to drop ashes. Weight about 27 lbs. Each.....\$2.00

DUCK NEST



Single Pattern

No.	Style	Weight, pounds	Price per Doz.
1	Single	11	\$ 8.00
2	Single	15	10.00
3	Single	18	12.00
4	Double	17	12.00

CHAMPION HEAVY
NEST TUYERE
IRON

Produces a circular rotary blast and concentrates it in Tuyere Nest, thereby making a hotter fire and heating iron quicker. Prevents heating elements in coal from going up chimney in waste. Has revolving pick which keeps slots free of clinkers, assuring full capacity blast at all times.



Whirlwind Blast

CHAMPION
TUYERE IRONS
Patent Adjustable
Nozzle

Made with large inlet for free access of air. The small necked patterns should not be used except with bellows or positive blower.

Price Each.....\$2.00

BLACKSMITHS' PINCERS
Oil Finished, Polished Jaws

Length, inches	Description	Price Pair	Price Dozen
10	Blacksmiths'	\$0.90	\$ 9.00
12	Blacksmiths'	1.00	10.00
14	Blacksmiths'	1.20	12.00
13	Farriers', Ex. Hvy.	1.30	13.00
14	Farriers', Ex. Hvy.	1.50	15.00

STRAIGHT LIP TONGS
Drop Forged, Solid Steel

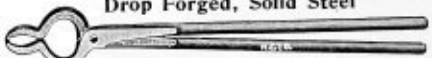
Length, inches	Price per Pair	Price per Dozen	Length, inches	Price per Pair	Price per Dozen
16	\$1.45	\$14.50	24	\$1.95	\$19.50
18	1.55	15.50	26	2.10	21.00
20	1.70	17.00	28	2.25	22.50
22	1.80	18.00	30	2.45	24.50

BOLT TONGS
Drop Forged, Solid Steel

Length, inches	For Iron Suitable	Price per Pair	Price per Dozen
18	1/4 or 3/8	\$1.55	\$15.50
20	3/8 or 1/2	1.70	17.00
22	5/8 or 3/4	1.80	18.00
24	3/4 or 1	1.95	19.50
24	1 1/4	1.95	19.50
24	1 1/2	1.95	19.50

GAD TONGS
Drop Forged, Solid Steel

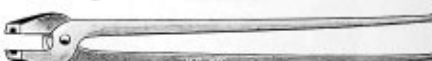
Length, inches	Price per Pair	Price per Dozen
18	\$1.55	\$15.50
20	1.70	17.00
22	1.80	18.00
24	1.95	19.50

PICK-UP TONGS
Drop Forged, Solid Steel

Length, inches	Price per Pair	Price per Dozen
22	\$1.80	\$18.00

PICK TONGS
Drop Forged, Solid Steel

Length, inches	Price per Pair	Price per Dozen
24	\$1.95	\$19.50

LATHE TOOL TONGS
For Holding Machine Tool Steel or Lathe Tools

Number	Length, inches	Takes Stock	Price per Pair	Price per Dozen
1	18	3/8 x 3/4	\$1.55	\$15.50
2	18	3/8 x 1	1.55	15.50
3	20	1/2 x 1	1.70	17.00
4	22	5/8 x 1 1/4	1.80	18.00
5	22	3/4 x 1 1/2	1.80	18.00

Always Order by Number

OIL FINISH SLEDGES AND HAMMERS



Double Face



Cross Pein

* Blacksmith
Hammer or Light
Weight Sledge

Price Per Pound

Weight, Pounds	Cross Pein	Double Face	*Blacksmith Hammer	Weight, Pounds	Cross Pein	Double Face	Blacksmith Hammer
2			\$0.50	10	\$0.30	\$0.30	
2½			.50	12	.30	.30	
3			.40	14	.30	.30	
4			.40	16	.30	.30	
5	\$0.30			20	.30	.30	
6	.30			24	.30	.30	
8	.30	\$0.30					

*NOTE:—Blacksmith Hammers are also furnished, with handles fitted at factory, complete per dozen extra, net \$1.25

STRIKING OR DRILLING HAMMERS
Long Pattern

Weight, Pounds	Price per Pound	Weight, Pounds	Price per Pound
3	\$0.40	6	\$0.30
3½	.40	8	.30
4	.40	10	.30
4½	.40	12	.30
5	.30	14	.30

SPAULING OR STONE HAMMERS



Price Per Pound

Weight Pounds	Single Face	Double Face	Weight Pounds	Single Face	Double Face
5	\$0.40		10	\$0.40	\$0.40
6	.40		12	.40	.40
7	.40		14		.40
8	.40	\$0.40			

STONE SLEDGES
Flat Face

Weight, Pounds	Price per Pound	Weight Pounds	Price per Pound
10	\$0.30	16	\$0.30
12	.30	20	.30
14	.30	24	.30

COAL SLEDGES



Weight, 5 lbs. and over.....per lb., \$0.30
 " 3 lbs. to 5 lbs....." .40

SHIP OR TOP MAULS



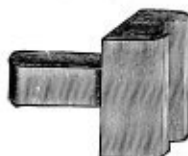
5 lb.per lb., \$0.42
 5½ lb." .42
 6 lb." .42

BLACKSMITHS' ANVIL TOOLS, OIL FINISHED

SWAGES



Top Swage



Bottom Swage

Size, inches	Price Each	Price Dozen	Size, inches	Price Each	Price Dozen
$\frac{1}{4}$	\$1.20	\$12.00	$\frac{1}{4}$	\$1.20	\$12.00
$\frac{3}{8}, \frac{1}{2}$ or $\frac{5}{8}$	1.20	12.00	$\frac{3}{8}, \frac{1}{2}$ or $\frac{5}{8}$	1.20	12.00
$\frac{3}{4}, \frac{1}{2}, 1$ or $1\frac{1}{4}$	1.60	16.00	$\frac{3}{4}, \frac{1}{2}, 1$ or $1\frac{1}{4}$	1.50	15.00
$\frac{1}{2}, 1\frac{1}{2}$ or 2	2.40	24.00	$1\frac{1}{2}, 1\frac{3}{4}$ or 2	2.40	24.00
$2\frac{1}{2}$	2.55	25.50	$2\frac{1}{2}$ or 2	3.20	32.00
$2\frac{1}{2}$ and $2\frac{3}{4}$	2.70	27.40	$3, 3\frac{1}{2}$ or 4	4.80	48.00
$3, 3\frac{1}{2}$ or 4	3.55	35.50			

FULLERS



Top Fuller



Bottom Fuller

Size, inches	Price Each	Price Dozen	Size, inches	Price Each	Price Dozen
$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8}$	\$1.38	\$13.80	$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$	\$1.38	\$13.80
$\frac{3}{4}, \frac{1}{2}, 1$	1.68	16.80	$\frac{5}{8}, \frac{3}{4}$	1.50	15.00
$1\frac{1}{4}$	2.04	20.40	$\frac{3}{4}, 1, 1\frac{1}{4}$	1.80	18.00
$1\frac{1}{2}, 1\frac{3}{4}, 2$	2.60	26.00	$1\frac{1}{4}, 1\frac{1}{2}, 1\frac{3}{4}$	1.95	19.50
$2\frac{1}{2}$	3.90	39.00	2	2.70	27.00
3	4.20	42.00	$2\frac{1}{2}$	3.20	32.00
			3	3.90	39.00

CUTTERS



Hot Cutter



Cold Cutter

Size, inches	Price Each	Price Dozen	Size, inches	Price Each	Price Dozen
$1\frac{1}{4}$	\$1.00	\$10.00	$1\frac{1}{4}$	\$1.20	\$12.00
$1\frac{1}{2}$	1.35	13.50	$1\frac{1}{2}$	1.50	15.00
$1\frac{3}{4}$	1.60	16.00	$1\frac{3}{4}$	1.80	18.00
2	2.70	27.00	2	2.70	27.00

FLATERS



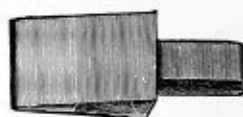
Size, inches	Price Each	Price Dozen
2 or $2\frac{1}{4}$	\$1.25	\$12.50
$2\frac{1}{4}$ or $2\frac{3}{4}$	1.80	18.00
3	2.50	25.00
$3\frac{1}{2}$	4.00	40.00

SET HAMMERS



Size, inches	Price Each	Price Dozen
1	\$9.48	\$9.48
$1\frac{1}{4}$	72	7.20
$1\frac{1}{2}$	90	9.00
$1\frac{3}{4}$	1.50	15.00
$1\frac{1}{2}$	2.10	21.00
2	2.70	27.00

HARDIES



Size, inches	Price Each	Price Per Dozen
$\frac{3}{8}$	\$0.75	\$ 7.50
1	.96	9.60
$1\frac{1}{8}$	1.20	12.00
$1\frac{1}{4}$	1.50	15.00
$1\frac{3}{8}$	1.65	16.50

CENTER PUNCH



Price Each, 38c; Dozen, \$3.75

PUNCHES



Round Eye Punch



Square Eye Punch

Size, inches	Price Each	Price Per Dozen
$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$	\$1.05	\$10.50
$\frac{5}{8}, \frac{3}{4}$	1.20	12.00
$\frac{7}{8}$	1.65	16.50

HEADING TOOLS

With Round or Square Holes



Size Hole, inches	Price Each	Price Per Dozen
$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$	\$1.80	\$18.00
$\frac{5}{8}, \frac{3}{4}$	2.00	20.00
$\frac{7}{8}, 1$	2.40	24.00

THE SUCCESS OF ONOKO



is due to the fact that it proves when used to be all we claim it is when we sell it.

At High Speeds and Under Crushing Loads

Onoko Babbitt Metal does the work so well and lasts so long that the demand for it has steadily increased from the time we first placed it on the market.

COLUMBIA ANVILS

Solid Wrought, Crucible Steel Face, Warranted



General Blacksmith Pattern



Farrier's Cliphorn Pattern



Sawmakers'

Solid forgings, all wrought iron, doubly refined. The crucible steel face, which is the very best that can be bought for this purpose, is carefully welded to the wrought iron.

Size of Face to Weight of Columbia Anvils

Face	Weight	Hardy Hole
3½ in. x 12½ in.	80 to 90 lbs.	7/8 in.
3½ " x 13½ "	100 to 110 "	7/8 "
3¾ " x 15 "	125 to 135 "	1 "
4 " x 15½ "	140 to 145 "	1 1/16 "
4 " x 16 "	150 to 160 "	1 1/16 "
4¼ " x 16½ "	170 to 180 "	1 1/8 "
4¼ " x 17 "	190 to 200 "	1 1/8 "
4½ " x 18 "	250 "	1 1/8 "
5 " x 20 "	300 "	1 1/4 "
5½ " x 22 "	350 "	1 1/4 "
6 " x 24 "	400 "	1 1/2 "

Punch hole is ½-inch diameter in anvils with 4-inch face and smaller. 5/16-inch in larger sizes.

VULCAN ANVILS

Charcoal Iron Base with Steel Face



Face is one solid piece of tool steel, thoroughly welded to body, accurately ground and tempered.

Extremity of horn is made entirely of tough steel and entire horn is covered with same material.

Body of anvil is made of a superior grade pig iron. Face and horn are warranted to be thoroughly welded to the body and not to separate.

Number	Weight, Pounds	Price Each
00	5	\$ 2.00
0	10	2.75
2	20	4.00
4	40	5.25
6	60	6.50
8	80	8.00
10	100	10.00
12	120	12.00
20	200	20.00
25	250	25.00

Prices :

80 to 400 lbs.	base per lb.	.....
70 " 79 "	1/2 cts. per lb. extra	.....
60 " 69 "	1 " " " "	.....
50 " 59 "	2 " " " "	.....
40 " 49 "	3 " " " "	.....
30 " 39 "	5 " " " "	.....
20 " 29 "	8 " " " "	.....
10 " 19 "	15 " " " "	.....

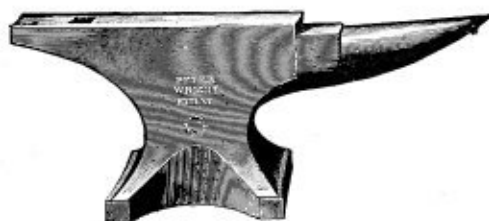
Cliphorn Anvils advance 1c per lb. over price of blacksmith pattern.

Sawmakers' Anvils are made in 50 lb. to 150 lb. (110 lb. standard) and advance 3c per lb. over price of blacksmith pattern. They are generally made with 3½ to 3¾-inch face.

PETER WRIGHT'S ANVILS

(Imported)

Wrought Iron with Steel Face



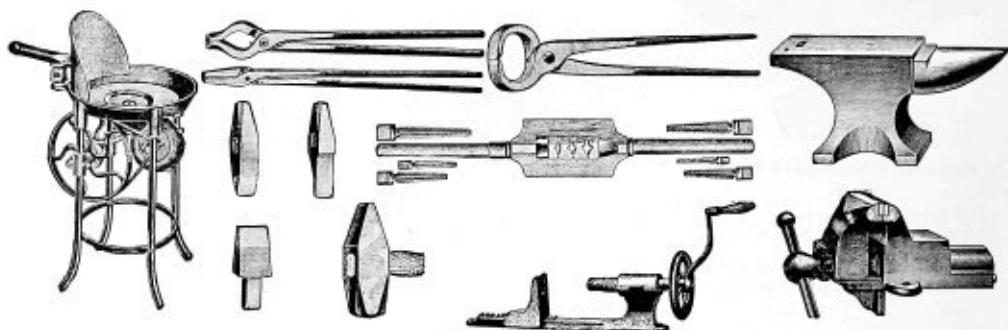
Weight, 85 to 500 lbs.	base	per lb.	\$	.....
" 71 " 84 "	advance	"	"	.01
" 61 " 70 "	"	"	"	.01½
" 51 " 60 "	"	"	"	.02
" 50 lbs. and lighter	"	"	"	.03

PETER WRIGHT'S FARRIERS' ANVILS

Farriers' Anvils, advance over blacksmiths' anvils, per lb. \$0.00½

No. 0 SPECIAL BLACKSMITH'S OUTFIT

This outfit will pay for itself on any farm in a short time, and is designed especially to meet the requirements of those who do not use these tools often enough to make an investment in a higher priced outfit profitable. Each tool is taken from our regular stock and is included in this outfit at a **SPECIAL LOW PRICE**.



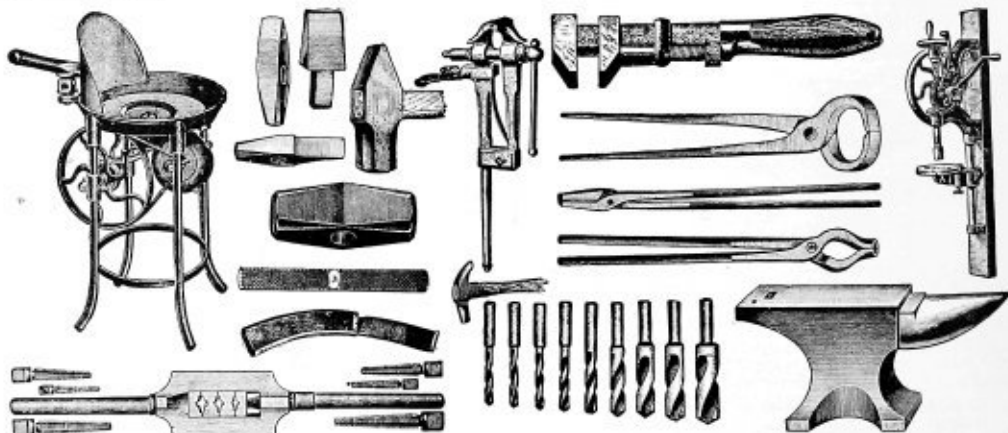
- 1 No. 150 Lever Forge, 18 in. hearth, 4 in. deep, 8 in. fan.
 1 40 lb. Vulcan Anvil, Charcoal Iron with Steel Face....
 1 Horizontal Blacksmith Drill, with socket fitted to take
 bit stock drills.....
 1 No. 40A Stock and Die, $\frac{1}{2}$ to $\frac{3}{4}$ inch, right hand..
 1 Pair of Farrier's 12 inch Pincers.....
 1 Pair of 20 inch Straight Lip Tongs..

- 1 Pair of 20 inch Bolt Tongs.
 1 2 lb. Blacksmith Hand Hammer, oil finished.
 1 Hardie for Anvil.
 1 Hot Cutter.
 1 Cold Cutter.
 1 Parallel Bench Vise, $3\frac{1}{2}$ -inch steel-faced jaws and steel
 screw.

COMPLETE OUTFIT No. 0, AS ABOVE, \$27.80

No. 10 SPECIAL BLACKSMITH'S OUTFIT

This outfit is composed of strictly high-grade tools, included in this set at **Special Low Prices**. Repair men, farmers and those who need a **reliable outfit of blacksmith's tools for general use** will find this set a paying investment.



- 1 No. 150 Lever Forge, 18 in. hearth, 4 in. deep, 8 in. fan,
 weight 65 pounds
 1 60 lb. Vulcan Anvil, Charcoal Iron with Steel Face.
 1 40 lb. Blacksmith Solid Box Vise with 4 inch jaws.
 1 No. 98 Post Drill, Self Feed; drills up to 1 inch to the
 center of a 14 in. circle, takes $\frac{1}{2}$ in. round shank
 drills.....
 1 Each Round Shank Drill for post drills, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$,
 $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 in.
 1 No. 60 Stock and Die, $\frac{1}{2}$ to $\frac{3}{4}$ inch, right hand.
 1 Pair of 12 inch Farrier's Pincers.....

- 1 Pair of 20 inch Straight Lip Tongs..
 1 Pair of 22 inch Bolt Tongs..
 1 Blacksmith Hand Hammer, oil finished.
 1 30 oz. Farrier's Hammer
 1 12 inch Knife Handle Wrench.
 1 8 lb. Striking Sledge, Handled.
 1 I. N. L. Farrier's Knife.
 1 Hardie for Anvil.
 1 Hot Cutter.
 1 Cold Cutter.
 1 10 inch Horse Rasp.

COMPLETE OUTFIT No. 10, AS ABOVE, \$56.20

No. 12 SPECIAL BLACKSMITH'S OUTFIT

A complete outfit containing all the tools required by first-class Blacksmiths, Horseshoers, Wagon Repairers, Ironworkers, etc. Every tool included has been selected for taking care of the heaviest work, and those who require and insist upon having nothing but the best will find this outfit absolutely satisfactory.



OUR No. 12 SPECIAL BLACKSMITH'S OUTFIT CONSISTS OF:

One 61 Lancaster Ratchet Forge, half hood, hearth, 28x40 .
 One 90 lb. Columbia Solid Wrought, Crucible Cast Steel Face Anvil Warranted, "it rings".
 One 60 lb. Blacksmith Solid Box Vise, 4½-inch jaw .
 One No. 98 Post Drill, Self Feed, Drills up to 1 inch to the center of a 14-inch circle, takes ½ round shank drills .
 One Each Round Shank Drills for Post Drill, sizes ⅛, ⅙, ¼, ⅕, ⅜, ½, ⅝, ¾, ⅞ and 1 inch.
 One Green River Screw Plate, complete with tap Wrench .
 One Set (5) General Purpose Drop Forged "S" Wrenches, fitting all sizes nuts from ⅜ to ½ inch.
 One Hardie for Anvil.
 One Hot Cutter.

One Cold Cutter.
 One Pair 20-inch Straight Lip Tongs .
 One Pair 20-inch Bolt Tongs, taking round iron up to ½ inch .
 One Pair 24-inch Bolt Tongs, taking round iron from ½ to ¾ inch .
 One Pair 14-inch Farriers Pincers .
 One 8-lb. Striking Sledge, handled.
 One 15-inch Knife Handle Wrench .
 One 3-lb. Blacksmith Hand Hammer, oil finished.
 One Farriers Hammer .
 One ¾-inch Hand Cold Chisel.
 One No. 2 "New Easy" Bolt Clipper, capacity up to ½ inch .
 One I. X. L. Farriers Knife .
 One 14-inch Horse Rasp .
 One Blacksmith's Leather Apron .

Complete Outfit as above\$113.00

If any of the tools in this set are not desired, proper deduction will be made. This will also apply to the other outfits where tools are identical, either for deductions or additions.

WHITEWASHING MACHINES

STYLE "A"

This is the largest and best machine on the market today. We recommend it for those having a large amount of cleaning to do, continuously or at short intervals.

Capacity equal to 30 men with brushes.

Equipment

Spray pipe complete with $\frac{1}{4}$ -inch cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, $\frac{3}{4}$ -inch discharge cock, one length of 1-inch suction hose and 20 feet of $\frac{1}{2}$ -inch Star special discharge hose.

List price.....\$44.00

Net weight, 80 lbs. Gross weight, 100 lbs.



We can furnish a "Special-A" machine which is built along the same lines as regular "A" shown above, but a great deal larger throughout and has a capacity of 75,000 square feet per day. Price quoted on application.

STYLE "D"

This is the smallest machine we make of this style. It is constructed of the same materials as style "C" but has a shorter pumping cylinder and a few modifications in design as shown in cut.

Capacity equal to work of 10 men with brushes.

Equipment

Spray pipe complete with $\frac{1}{4}$ -inch cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, one length of 1-inch suction hose and 10 feet of $\frac{1}{2}$ -inch Star special discharge hose.

List price.....\$25.00

Net weight, 60 lbs. Gross weight, 75 lbs.



STYLE "E"

We illustrate the "Comet" machine, consisting of style "C" pump mounted on a heavy-trucked platform, provided with a 30-gallon tank to which is connected complete with strainer, the suction pipe. Tank is also equipped with improved agitator, connected to pump, and by means of which covering materials are kept in perfect agitation while being applied. The portability of this complete machine enables it being filled with covering material any distance from and wheeled to work.

Capacity equal to work of 16 men with brushes.

Equipment

Spray pipe complete with $\frac{1}{4}$ -in. cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, and 10 feet of $\frac{1}{2}$ -inch Star special discharge hose.

List price.....\$40.00

Net weight, 125 lbs. Gross weight, 150 lbs.



We can mount any of the sizes of machines in same manner as above if desired. Prices on application, stating size wanted.

STYLE "J"

The illustration represents style "J" machine. The pumping cylinder and air chamber is constructed entirely of brass which will not corrode from the use of any liquids. One man can operate this machine alone and from 80 to 90-pounds pressure can be easily carried.

Capacity equal to work of 6 men with brushes.

Equipment

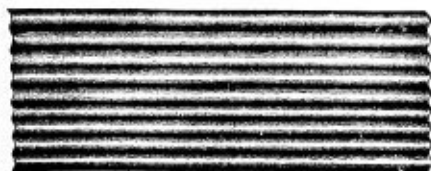
Spray pipe complete with $\frac{3}{8}$ -inch cock and spray nozzle, follower wrench, and 10 feet of $\frac{3}{8}$ -inch discharge hose.

List price.....\$12.60

Net weight, 30 lbs. Gross weight, 40 lbs.



SHEET IRON ROOFING



Corrugated Roofing
2 1/2 inch Corrugations



2V Crimped Roofing

We can furnish from Chicago stock, corrugated sheets, either painted or galvanized, in 18, 20, 22, 24, 26 or 28 gauge, with 1 1/4 inch or 2 1/2 inch corrugations, in 6, 7, 8, 9, 10 or 12 foot lengths.

Full width of sheets is 26 inches: actual covering width 24 inches.

Corrugated is the strongest form of sheet metal known. Corrugated sheets do not suffer from expansion or contraction and impart strength to the structure to which they are attached.

Two or three V Crimped Roofing furnished, either painted or galvanized in 22, 24, 26 and 28 gauge and in 6, 7, 8, 9, 10 and 12 ft. lengths. Actual covering width of sheets is 24 inches.

We furnish necessary sticks with this style roofing unless instructed to the contrary.

PRICES UPON APPLICATION

PLAIN RIDGE ROLL AND PLAIN V RIDGE CAPPING



Ridge Roll



V Ridge Cap

Ridge Roll and V Capping furnished from Chicago stock, either painted or galvanized in all standard gauges and lengths. The girt for plain ridge roll is 14 inches and for plain V ridge capping, 10 inches.

SHEET IRON SIDING

We can furnish from Chicago stock, beaded, weatherboard, plain brick and stone siding, either painted or galvanized, in all standard sizes and gauges.



Plain Brick



Weatherboard



Rock Face Stone

Weight Per Square (100 Square Feet.)

Gauge	BEADED SIDING		WEATHERBOARD SIDING		PLAIN BRICK, ROCK FACE BRICK AND ROCK FACE STONE SIDING	
	Painted	Galvanized	Painted	Galvanized	Painted	Galvanized
28	70	85	75	91	64	78
27	76	91	82	98	71	85
26	83	98	89	106	77	91
24	110	125	119	135	..	..

Our mill connections enable us to quote to good advantage on specifications of roofing and siding large enough to warrant mill shipment.

We are also prepared to furnish promptly, roofing tin, gutters, conducting pipe, fittings and accessories.

RULES OF MEASUREMENT IN ORDERING SHEET STEEL ROOFING

All roofing, siding, etc., except galvanized, is painted both sides unless otherwise ordered. All roofing, siding, etc., is sold by the square except corrugated sheets which are sold by the square or pound as desired. A square consists of 100 sq. ft. covered surface and is calculated by the following rules:

For Corrugated Sheets: Full width and length of sheets after being corrugated are calculated, no allowance made for side or end laps. On siding one inch lap will do, while for roofing not less than three inches, and if a slight pitch, six inches, for end laps.

For V-Crimped, Beaded and Weather Board: Full length of sheets by actual covering width is calculated. Nails and washers are extra and not included in price quoted on roofing unless specially mentioned. Ridge roll and cap, flashing, etc., are sold by the lineal foot and are not included in price unless especially mentioned.

APPROXIMATE WEIGHTS

Per square of 100 square feet of **Corrugated Sheets** $1\frac{1}{4}$ inch and $2\frac{1}{2}$ inch corrugations

Gauge	$1\frac{1}{4}$ INCH CORRUGATIONS		$2\frac{1}{2}$ INCH CORRUGATIONS	
	Painted	Galvanized	Painted	Galvanized
28	72	87	68	85
27	79	94	76	91
26	86	101	83	98
24	114	129	110	124
22	142	157	136	151
20	...	...	163	178
18	...	...	217	232
16	...	...	271	286

APPROXIMATE WEIGHTS

Per Square of 100 square feet of **2-V-Crimped** and **3-V-Crimped** Roofing

Gauge	V-CRIMPED—WITHOUT STICKS		3-V-CRIMPED—WITHOUT STICKS	
	Painted	Galvanized	Painted	Galvanized
28	70	85	72	88
27	76	91	79	95
26	83	98	86	102
24	110	125	114	130
22	137	152	142	158
20	164	179	170	186

For Sticks with 2-V-Crimped, add about 4 lbs. per square.

For Sticks with 3-V-Crimped, add about 8 lbs. per square.

NUMBER OF SHEETS PER SQUARE

Length Sheets	$1\frac{1}{4}$ Inch Corrugated	$2\frac{1}{2}$ Inch Corrugated	V-Crimped	3-V-Crimped
6	8	7.70	$8\frac{1}{2}$	8
7	$6\frac{5}{8}$	6.60	$7\frac{1}{2}$	$6\frac{5}{8}$
8	6	5.77	$6\frac{3}{4}$	6
9	$5\frac{1}{2}$	5.13	$5\frac{5}{8}$	$5\frac{1}{2}$
10	$4\frac{1}{2}$	4.62	5	$4\frac{1}{2}$
12	4	3.846	4.166	4

LEAD ROOFING WASHERS



These washers make an absolute watertight joint. One pound will put on two to three squares, and contains about 325 washers.

Made in three sizes. Always order by number.
 Packed { in bulk in 50, 100 and 500 lb. boxes.
 { in 5 lb. cartons, 50, 75 and 100 lb. boxes.

BARBED ROOFING NAILS



Large headed. Made especially for roofing purposes. In No. 10 gauge, $\frac{7}{8}$ inch and 1 inch long.

Roofing nails in all sizes and lengths are fully listed elsewhere in this book (see index).

RUBBER, COMPOSITION AND GRAVEL ROOFING

MONARCH ROOFING

Made from heavy wool felt of the finest quality, saturated and coated with genuine Trinidad Lake asphalt and surfaced on both sides with a combination of finely ground slate and mica, intensifying the resisting powers of the roofing and rendering it fire-proof against flying embers. Put up in rolls containing sufficient material to cover 100 square feet of surface.

2 ply weighs approximately 47 lbs. per roll.

3 ply weighs approximately 57 lbs. per roll.

4 ply weighs approximately 70 lbs. per roll.

Nails, caps and cement for laying packed securely in center of each roll.

WATERPROOF COMPOSITION RUBBER ROOFING

Made of all wool felt, thoroughly saturated either with genuine asphalt or with specially distilled non-volatile coal tar and coated with a hard rubber composition, rendering it impervious to heat and moisture. Each roll contains sufficient material to cover 100 square feet of surface.

1 ply weighs approximately 35 lbs. per roll.

2 ply weighs approximately 45 lbs. per roll.

3 ply weighs approximately 55 lbs. per roll.

Nails, caps and cement for laying packed securely in center of each roll.

CRUSHED STONE OR GRAVEL ROOFING

Made from best quality all wool felt, thoroughly saturated either with genuine asphalt or specially distilled non-volatile coal tar and surfaced on one side either with crushed stone or with screened gravel, giving most effective protection against the elements and against flying embers and brands. This style roofing is considered the longest lived on the market. Put up in rolls containing sufficient material to cover 100 square feet of surface. Nails, caps and cement for laying, packed securely in center of each roll.

COMPOSITION PAINT OR COATING

Composition Paint or Coating carried in stock in barrels, half barrels, 10, 5, 2 and 1 gallon cans.

ROOFING CEMENT

Roofing Cement carried in stock in barrels, 60-lb. tubs and gallon pails.

METAL PAINT

Metal Paint carried in stock in barrels, half barrels, 10, 5, 2 and 1 gallon cans.

BUILDING PAPERS

ROSIN SIZED SHEATHING

Put up in rolls containing 500 square feet.

No. 40 weighs approximately 40 lbs. per roll.

No. 35 weighs approximately 35 lbs. per roll.

No. 30 weighs approximately 30 lbs. per roll.

No. 25 weighs approximately 25 lbs. per roll.

No. 20 weighs approximately 20 lbs. per roll.

BLUE PLASTER BOARD

Put up in rolls containing 250 and 500 square feet and weighing approximately 60 lbs. per roll of 500 square feet.

Deadening Felt.—Put up in rolls containing 50 square yards.

No. 40— $\frac{3}{4}$ lb. per square yard; 40 lbs. per roll.

No. 50—1 lb. per square yard; 50 lbs. per roll.

No. 75— $1\frac{1}{2}$ lbs. per square yard; 75 lbs. per roll.

No. 100—2 lbs. per square yard; 100 lbs. per roll.

TAR AND ASPHALT FURNACE.

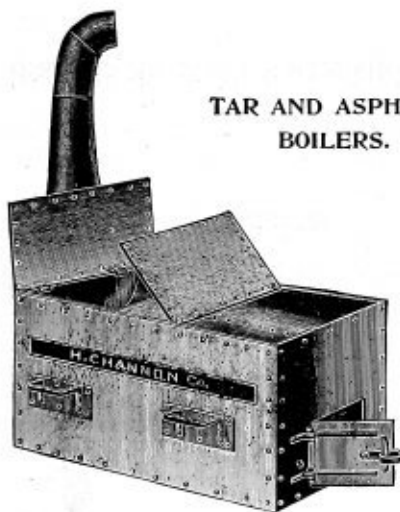
Sides and ends are easily taken apart and put together. Draft fits either end. Bottom of Mixing Pan 3x10 feet.



Made of steel, double annealed, with Norway iron trimmings. Close riveted.

36 in. x 120 in. x 12 in.	Each.....	\$140.00
40 " x 120 " x 14 "	Each.....	150.00

TAR AND ASPHALT BOILERS.



3-Barrel.....	\$60.00
2 ".....	50.00
1 ".....	45.00



Mop Barrel.
\$4.50

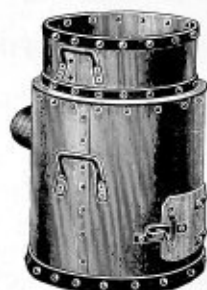


Dipper.
\$2.50



Hoisting Pail.
\$4.00

ROUND TAR HEATERS



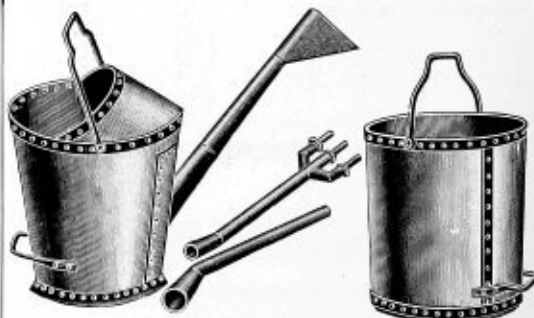
3- Barrel Round Tar Heaters.....	\$60.00
1½-Barrel Round Tar Heaters.....	45.00

SMALL TAR HEATERS



½-Barrel Round Tar Heaters with pockets for heating gravel for use on small repair jobs.....\$49.00
Same, without pockets.....38.00
Pockets on large square or round heaters when ordered.

TAR PAILS



Pay-off Pail

Carrying Pail

Pay-off Pail.....	\$5.00
Pay-off Pail Spouts for wood or stone, each.....	1.00
3-way Spouts for Brick or Stone.....	5.00
Carrying Pail.....	3.00

MOGUL STOVES



Regular Pattern

These stoves are made from new patterns and are superior in design and finish to any stove of their class on the market.

Will burn hard or soft coal, wood or natural gas.

All stoves are furnished with ash pan, shaking and dumping grate, lever, shelf and damper, without extra charge. We are also prepared to furnish sheet-iron drums, water bowls and attachments for bolting to floor at low prices. The regular pattern is for general use as a station stove for railroads, or for general heating, as in construction sheds, riggers and tool houses, etc. Strictly first class throughout.

No.	Diameter, inches	Height, inches	Weight, pounds	Price
1	15	40	300	\$12.00
2	17	45	350	14.00
3	19	50	450	18.00

The No. 1 Caboose Stove is regularly furnished with fastenings for door and ash pan and lugs for bolting to floor of caboose. Has ash pan, shaking and dumping grate, lever, shelf and damper furnished without extra charge. In every respect equal to any stove made.

No. 1 Caboose Stove.....\$14.00



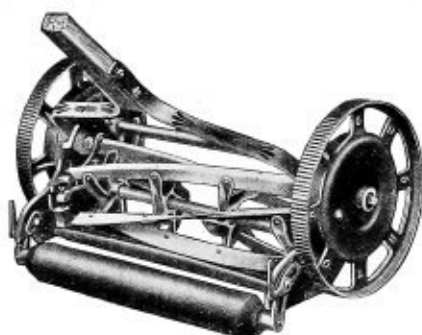
No. 1 Caboose Stove

LAWN MOWERS

We wish to direct particular attention to our line of Lawn Mowers, which are made specially to our order by one of the largest manufacturers in the country. These machines are sold under our own brands and the quality represented by each brand is fully equal, if not superior to many Lawn Mowers sold at much higher prices.

BOUGHTON BALL BEARING LAWN MOWER

Eleven Inch Wheels—Five Blades



Boughton

This is a strictly high grade machine of the very finest quality. It is light running and noiseless in operation and for even cutting and long wearing qualities cannot be excelled. Balls, cups and cones are of highest grade steel, uniformly hardened and dust-proof. The reel is $5\frac{3}{4}$ inches in diameter, has five blades of best knife steel and is adjusted to the cutter by a special adjusting and locking device, making the frame absolutely rigid and impossible to get out of alignment, unless unnecessarily tampered with. Wheels are 11 inches in diameter.

16 inch	\$14.00
18 inch	15.00
20 inch	16.00

VAN KLEECK BALL BEARING LAWN MOWER

Ten Inch Wheels—Four Blades



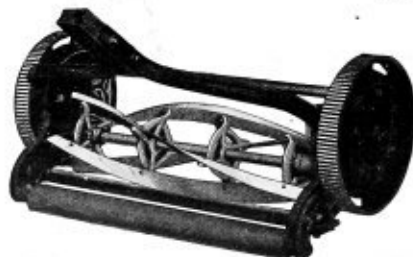
Van Kleeck

This Mower is built of strictly first-class material throughout. It is strong and well finished and of exceptionally light draft; fitted with patent ball bearing adjustments, which are the simplest and most effective made. Has highest quality steel balls, cups and cones, uniformly hardened, accurately ground and dust proof. Reel is $5\frac{3}{4}$ inches in diameter and has four blades. Wheels are 10 inches in diameter.

16 inch	\$ 9.50
18 inch	10.25

HARRISON LAWN MOWERS

Nine Inch Wheels—Four Blades



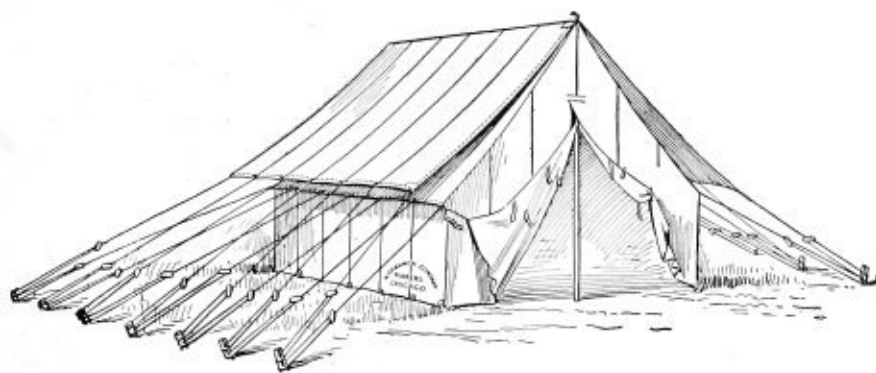
Harrison

This Mower is strongly recommended where a thoroughly serviceable, light-running machine is wanted at a moderate price. It is strictly first-class in every respect and is fully warranted against defective material or workmanship. Fitted with self-aligning, adjustable, plain bearings. All working parts are fully incased to protect them from dirt. Reel is $5\frac{3}{4}$ inches in diameter and has four blades. Wheels are 9 inches in diameter.

14 inch	\$6.00
16 inch	6.50

GRASS CATCHERS are fully listed and described elsewhere in this book (see index)

WALL TENTS



The above cut shows tents with flies.

Prices given below are for tents complete with poles and pins, but without flies. Flies are listed at 50 per cent of tents of corresponding sizes.

Size, Feet.	Height of Pole, Feet.	Height of Wall, Feet.	8-oz. Duck, Single Filling.	10-oz. Duck, Single Filling.	12-oz. Duck, Single Filling.	10-oz. Duck, Double and Twisted Filling or 8-oz. Army Duck.	12-oz. Duck, Double and Twisted Filling or 10-oz. Army Duck.	12-oz. Army Duck or No. 10.	15-oz. Army Duck or No. 8.
7 x 7.....	7	3	\$ 8.00	\$ 9.35	\$11.22	\$ 10.35	\$ 12.25	\$ 14.55	\$ 17.50
7 x 9.....	7	3	9.50	11.05	13.26	12.30	14.60	17.50	20.90
9 x 9.....	7½	3	10.95	12.80	15.36	14.30	17.00	20.30	24.50
9½ x 12.....	7½	3	12.90	15.05	18.06	16.80	19.95	23.80	28.70
9½ x 14.....	7½	3	14.65	17.10	20.52	19.10	22.65	27.05	32.55
12 x 12.....	8	3½	15.30	17.95	21.54	20.00	23.75	28.40	34.25
12 x 14.....	8	3½	17.30	20.20	24.24	22.55	26.80	32.05	38.60
12 x 16.....	8	3½	19.20	22.45	26.94	25.05	29.80	35.65	43.00
12 x 18.....	8	3½	21.35	24.95	29.94	27.80	33.00	39.45	47.50
14 x 14.....	9	4	20.60	24.15	28.98	26.95	32.10	38.45	46.45
14 x 16.....	9	4	22.70	26.65	31.98	29.80	35.50	42.55	51.35
14 x 18.....	9	4	25.35	29.75	35.70	33.20	39.45	47.30	57.10
14 x 20.....	9	4	28.20	32.75	39.30	36.40	43.00	51.15	61.40
14 x 24.....	9	4	31.80	36.90	44.28	41.00	48.10	57.25	68.75
16 x 16.....	11	5	28.20	33.20	39.84	37.15	44.10	53.05	64.25
16 x 18.....	11	5	30.95	36.40	43.68	40.75	48.25	58.00	70.20
16 x 20.....	11	5	34.10	39.80	47.76	44.30	52.15	62.30	75.00
16 x 24.....	11	5	38.85	45.20	54.24	50.25	59.05	70.40	84.65
16 x 30.....	11	5	47.00	54.75	65.70	60.85	71.50	85.30	102.60
16 x 35.....	11	5	52.60	61.30	73.56	68.10	80.20	95.60	114.95
18 x 18.....	11	5	35.40	41.60	49.92	46.45	55.20	66.20	79.95
18 x 20.....	11	5	39.00	45.45	54.54	50.50	59.70	71.10	85.45
18 x 24.....	11	5	43.60	50.85	61.02	56.50	66.50	79.25	95.25
18 x 30.....	11	5	52.25	60.90	73.08	67.75	79.95	95.35	114.65
18 x 35.....	11	5	58.15	67.80	81.36	75.40	89.05	106.25	127.75
18 x 40.....	11	5	68.40	78.55	94.26	88.65	105.15	125.40	152.00
20 x 24.....	11	5	45.85	52.65	63.18	59.45	70.50	84.05	101.90

These prices are figured on pole ridges.

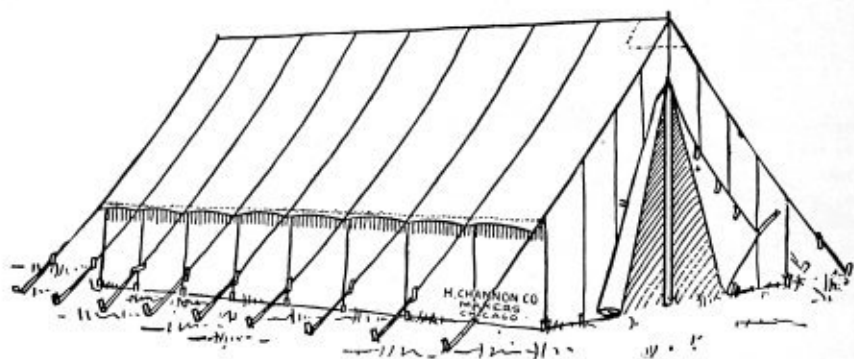
Rope ridges can be furnished at a small additional cost.

Should poles not be desired a discount of 5 per cent may be taken from the above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof must be added.

Wall Tents Roped, see next page.

LARGE WALL TENTS

Extra Hand Roped and Finished



The above cut shows a tent without fly.

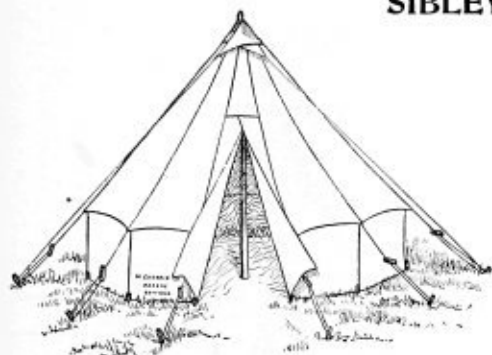
Prices given below are for tents complete with poles and pins, but without flies. Flies are listed at 50 per cent of tents of corresponding sizes.

Size, feet.	Height of Pole.	Height of Wall.	8-oz. Single Filling Duck.	10-oz. Single Filling or 8-oz. Double Filling Duck.	10-oz. Double Filling or 8-oz. Army Duck.	12-oz. Double Filling or 10-oz. Army Duck.	12-oz. Army or No. 10 Duck.	15-oz. Army or No. 8 Duck.
21 X 30	11 feet	5 feet	\$ 89.00	\$101.00	\$113.00	\$127.50	\$141.50	\$173.50
21 X 35	11 "	5 "	104.50	118.50	132.50	149.50	166.00	204.00
21 X 40	11 "	5 "	115.00	130.50	146.00	164.50	182.50	224.50
21 X 49	11 "	5 "	136.00	154.50	173.00	194.50	216.50	265.50
24 X 28	13 "	6 "	105.50	120.00	134.50	151.00	168.00	206.50
24 X 35	13 "	6 "	125.00	142.00	159.00	179.00	199.00	244.00
24 X 42	13 "	6 "	144.50	164.00	183.50	206.50	229.50	282.00
24 X 51	13 "	6 "	169.50	192.50	215.50	242.50	269.50	331.00
24 X 60	13 "	6 "	195.00	221.50	248.00	279.00	310.00	381.00
24 X 65	13 "	6 "	207.50	236.00	264.50	297.50	330.50	406.00
30 X 37	15 "	6 "	160.00	182.00	204.00	229.50	255.00	313.00
30 X 42	15 "	6 "	175.00	199.00	223.00	250.50	278.50	342.50
30 X 47	15 "	6 "	189.50	215.50	241.50	271.50	301.50	370.50
30 X 51	15 "	6 "	204.00	232.00	260.00	292.50	325.00	399.00
30 X 56	15 "	6 "	219.00	249.00	279.00	313.50	348.50	428.50
30 X 60	15 "	6 "	233.50	265.50	297.50	334.50	371.50	456.50
30 X 65	15 "	6 "	248.50	282.50	316.50	356.00	395.50	486.00
30 X 70	15 "	6 "	263.00	299.00	335.00	376.50	418.50	514.50

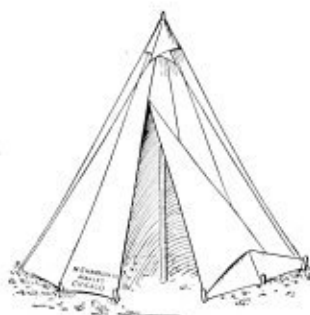
The above tents are roped on ridges and gables and every fourth seam on top. Additional roping will be charged for at the rate of 8 cents per foot.

Should poles not be desired a discount of 5 per cent may be taken from the above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof must be added.

SIBLEY TENTS

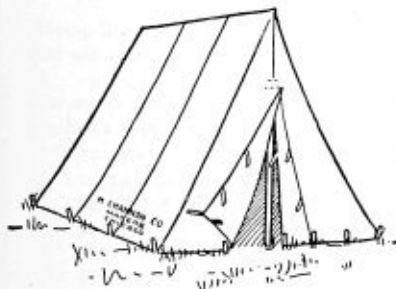


Sibley Tent with Wall



Sibley Tent without Wall

WITH 2½-FOOT WALL					WITHOUT WALL				
Diameter, Feet	Height, feet	PRICE EACH			Diameter, feet	Height, feet	8-oz. Single Filling Duck	10-oz. Single Filling Duck	12-oz. Double and Twisted Filling Duck
		8-oz. Single Filling Duck	10-oz. Single Filling Duck	12-oz. Double and Twisted Filling Duck					
10	8	\$11.25	\$12.75	\$17.75	10	8	\$ 8.25	\$ 9.50	\$13.00
12	9	14.00	16.00	22.00	12	9	10.50	12.00	16.75
14	10	16.75	19.00	26.25	14	10	13.25	15.25	21.00
16	11	22.00	25.00	34.75	16	11	17.75	20.25	28.00
20	13	32.50	37.25	51.50					



"A" OR WEDGE TENTS

Prices given below are for tents complete with poles and stakes.

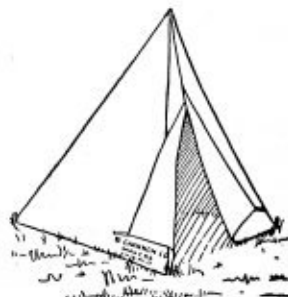
Size, Feet.	Height, Feet.	8-oz. Duck, Single Filling.	10-oz. Duck, Single Filling.	12-oz. Duck, Single Filling.	12-oz. Double Filling.
5 x7	6	\$ 5.00	\$ 5.80	\$ 7.10	\$ 7.55
7 x7	7	6.30	7.35	9.00	9.90
7 x9	7	7.55	8.85	10.86	11.70
9 x9	7	8.35	9.85	12.07	13.05
9½x12	7½	10.30	12.10	14.82	16.10
12 x14	9	14.80	17.45	21.38	23.30

The above shows the wedge tent with pole ridge. We make them also with rope ridges.

MINERS' TENTS

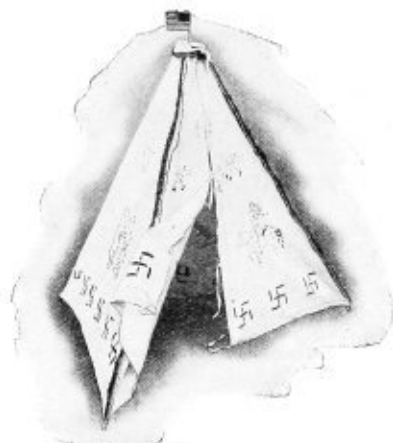
Without Wall

Size, Feet.	Height of Pole, Feet.	8-oz. Duck, Single Filling	10-oz. Duck, Single Filling	12-oz. Duck, Single Filling.	12-oz. Duck, Double Twisted Filling.
7x 7	7	\$ 4.40	\$ 5.05	\$ 6.19	\$ 7.00
9x 9	8	6.60	7.60	9.31	10.55
12x12	9	10.00	11.55	14.16	16.00



CHANNON'S WIGWAMS

For the Boy and Man



No. 4 Special



Nos. 1, 2, 3

WHILE we manufacture tents of every description we take special pride in our "Wigwam." Its chief features are free floor space and portability. Like the tepee of the American Indian, it is built without a center pole. A tripod supports the canvas, and the poles are hinged in the center, so that the entire outfit can be folded, wrapped in a bundle and carried like a gun.

The ease with which this wigwam is put up and taken apart and carried from place to place will quickly recommend it to those who want a small but serviceable tent. This is a Channon tent, and only the best materials are used in its construction. For durability it has no superior.

Wigwam is 7 feet 6 inches high, 7 feet 6 inches in diameter, contains 45 square feet of floor space, and will easily hold three persons. The sides are decorated in Indian designs, and the outfit includes a colored cap and flag, besides the canvas and the tripod.

	PRICE OF OUTFIT
No. 1 (made of extra heavy white drill).....	\$ 5.00
No. 2 (made of 8-oz. duck).....	\$ 6.25
No. 3 (made of standard colored drill).....	\$ 6.25

No. 4 SPECIAL FOR BOYS

Special for Boys—We make this wigwam in special size and style for boys, 4 feet high, 5 feet in diameter. Sides are made of heavy sheeting, and also decorated in genuine Indian design. Outfit includes tripod and canvas. This is not a tent suitable for camping out, but for boys' play, and for use on lawns it gives thorough satisfaction. The price has been reduced below any heretofore made on tents of equal quality. Each special boys' wigwam packed in heavy paper box. Weight 4 lbs. packed.

It's a small investment to make your boy happy and to keep him engaged in healthful play.

Playing Indian and hunter is always dear to a boy's heart, and the additional fun derived from the possession of a real wigwam can hardly be calculated. The adventures of Leatherstockings, the hunter and scout, is a story every boy has read, and the scenes will be enacted again and again. The wigwam as a dressing room and shady retreat when out of the water would save many a sunburned back. The best swimming hole is always too near the road or house to be safely used. But the wigwam as a dressing room would make it the jolliest place of them all. After all, there is no place where quite so much fun can be had as at home, and the great Indian fight which will take place on the lawn, under the eyes of father, mother and sisters, will be greater sport than all the others.

No. 4 Special for Boys.....	\$2.00
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FAMILY COMPARTMENT TENTS



GROUND PLAN - 14 x 22 1/2 FAMILY COMPARTMENT TENT



Prices given below are for tents complete with poles and pins, but without flies. Flies are listed at 50 per cent of tents of corresponding sizes.

Size—Feet.	Height of Wall, Feet.	Height of Pole, Feet.	Size and Number of Bed Rooms.	Size of Dining Room.	10-oz. Dbl. Filling, or 8 oz. Army Duck.	12 oz. Dbl. Filling, or 10 oz. Army Duck.	12 oz. Army Duck Top and 10 oz. Army Duck Wall.
9 X 16 1/2	6	10	2-5 1/2 X 9	5 1/2 X 9	\$45.50	\$51.50	\$54.25
9 X 19	6	10	2-6 X 9	7 X 9	49.50	56.50	59.50
12 X 19	6	11	4-6 X 6	7 X 12	58.50	66.50	70.50
12 X 21 1/2	6	11	4-6 X 7	7 1/2 X 12	63.50	72.50	77.00
14 X 21 1/2	6	12	4-7 X 7	7 1/2 X 14	70.00	79.50	84.50
14 X 23 1/2	6	12	4-7 X 7	9 1/2 X 14	74.50	84.50	90.00
16 1/2 X 23 1/2	6	13	4-8 1/4 X 8 1/4	7 X 16 1/2	84.50	96.50	102.50
16 1/2 X 26	6	13	4-8 X 8 1/4	10 X 16 1/2	91.00	103.00	110.00
16 1/2 X 28	6	13	4-8 X 8 1/4	12 X 16 1/2	97.50	111.00	118.50

NOTE—The awning shown above is part of the wall, on either or both sides of the tent, raised to give agreeable shade and free circulation of air. When desired these can be lowered and secured as balance of the wall. The partitions are of sheeting, same height as the wall, attached to cords stretched from center poles to sides and ends.

Should poles not be desired a discount of 5 per cent may be taken from the above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof must be added.

REFRESHMENT TENTS

With Portable Walls

Prices given below are
for tents complete with
poles and pins.



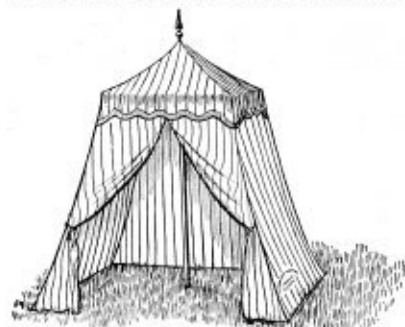
NOT ROPED

Size.	Height of Wall Feet.	Height Center Pole, Feet.	WITH WALL.				WITHOUT WALL.			
			8-oz. White Duck, S. F.	10-oz. White Duck, S. F.	8-oz. Blue and White Striped Duck	10-oz. Blue or Brown Striped Duck	8-oz. White Duck, S. F.	10-oz. White Duck, S. F.	8-oz. Blue and White Striped Duck	10-oz. Blue or Brown Striped Duck
9x14	6	10	\$25.76	\$30.98	\$34.10	\$40.15	\$17.38	\$19.33	\$20.45	\$23.81
9x16½	6	10	28.34	33.28	36.76	43.95	18.29	20.51	21.78	25.73
9x19	6	10	29.40	35.20	39.20	48.42	19.53	22.13	23.66	28.41
12x19	6	11	33.46	38.92	42.75	54.40	21.80	24.37	26.22	31.75
12x23½	6	11	41.45	47.95	52.60	66.55	24.64	27.82	29.94	36.50
14x21½	6	12	42.44	48.90	53.95	68.08	27.18	30.24	32.93	39.83
14x23½	6	12	44.84	52.05	57.24	72.73	28.72	32.36	34.98	42.84

THOROUGHLY ROPED.

9x14	6	10	\$30.20	\$43.20	\$45.82	\$52.62	\$27.48	\$29.96	\$31.69	\$33.86
9x16½	6	10	41.90	46.34	49.26	56.84	29.38	31.36	32.78	35.82
9x19	6	10	44.94	49.87	52.74	61.50	31.45	33.80	35.40	38.88
12x19	6	11	49.30	54.90	58.50	68.10	34.96	37.76	39.65	43.82
12x23½	6	11	55.75	62.38	66.08	78.13	39.53	42.94	45.23	50.50
14x21½	6	12	60.30	67.16	71.88	83.45	43.51	47.15	49.50	55.13
14x23½	6	12	63.60	71.03	75.84	88.60	45.83	49.80	52.47	58.80

Should poles not be desired a discount of 5 per cent may be taken from the above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof should be added.



Without Awning Extension.

PALMETTO TENTS

WITHOUT AWNING EXTENSIONS

Size of Base, Feet.	Size of Top.	Height in Center.	Height at Side.	Price Each, Drill.	Price Each, 8-oz. Single Filling Duck.	Price Each, 10-oz. Single Filling Duck.	Price Each, Blue or Brown Stripe.
7 x 7	2 ft. 4 in.	7 ft. 6 in.	6 ft. 0 in.	\$ 7.50	\$ 8.75	\$ 9.75	\$11.00
8 x 8	2 " 4 "	8 " 0 "	6 " 6 "	8.75	10.00	11.25	12.75
9 x 9	3 " 6 "	8 " 6 "	7 " 0 "	10.75	12.75	14.25	16.00
10 x 10	3 " 6 "	9 " 0 "	7 " 6 "	12.00	14.25	16.00	18.00

WITH AWNING EXTENSIONS

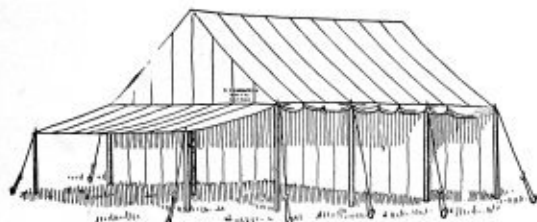
7 x 7	3 ft. 6 in.	8 feet.	6 ft. 6 in.	\$11.00	\$12.50	\$13.75	\$15.25
8 x 8	3 " 6 "	8 " "	6 " 6 "	12.00	13.75	15.00	16.75
9 x 9	4 " 8 "	9 " "	7 " "	14.00	16.50	18.00	20.25
10 x 10	4 " 8 "	10 " "	8 " "	16.00	18.50	20.75	23.25
12 x 12	5 " 6 "	10 " "	8 " "	18.00	21.00	23.50	26.50

Should poles not be desired a discount of 5 per cent may be deducted from the above list prices. Should higher walls be desired than listed above 5 per cent for each foot or fractional foot should be added.



With Awning Extension.

CAMPING AND HIP ROOF TENTS



Camping Tent with Portable Walls and Partitions



Square Hip Roof Tent

CAMPING TENTS

Complete with poles and pins, but without flies. Flies list at 50% of tents of corresponding size.

Size.	Height of Wall.	Height of Center Poles.	10-oz. Double Filling, or 8-oz. Army Duck.	12-oz. Double Filling, or 10-oz. Army Duck.	12-oz. Army, or No. 10 Duck.
12 x 14	6	11	\$ 51.00	\$ 57.50	\$ 63.50
12 x 16½	6	11	56.00	63.00	70.00
12 x 18½	6	11	61.50	69.50	77.00
12 x 21	6	11	66.50	75.00	83.50
12 x 24	6	11	72.00	81.50	90.50
12 x 28	6	11	82.50	92.50	103.00
12 x 30	6	11	88.00	99.00	110.00
14 x 16½	6	12	65.50	73.50	82.00
14 x 18½	6	12	69.50	78.00	87.00
14 x 21½	6	12	75.00	84.50	94.00
14 x 23½	6	12	80.50	90.50	101.00
14 x 28	6	12	92.00	103.50	115.00
14 x 30	6	12	97.50	109.50	122.00
16½ x 18½	6	13	75.50	85.00	94.50
16½ x 21½	6	13	85.00	96.00	106.50
16½ x 23½	6	13	91.50	102.50	114.00
16½ x 28	6	13	103.50	116.50	129.50
16½ x 30	6	13	110.50	124.00	138.00

Should poles not be desired, a discount of 5 per cent may be taken from the above list prices. Should higher walls be desired than specified in the list above, 5 per cent for each additional foot or fraction thereof should be added.

SQUARE HIP ROOF TENTS

Complete with poles and pins and roped wherever necessary.

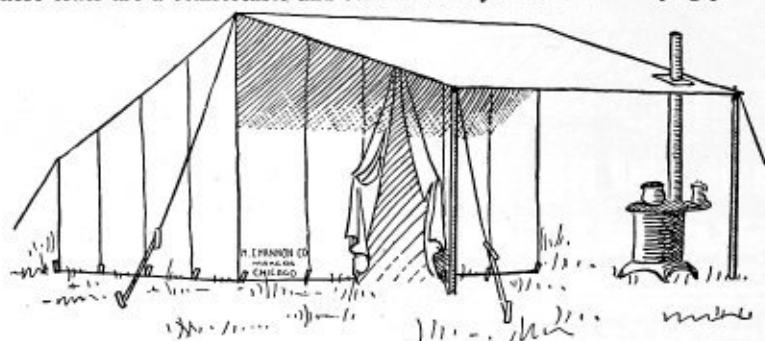
Size, Feet.	Height of Wall, Feet.	Height of Centre Pole, Feet.	Price Each. 8 oz. Single Filling Duck.	Price Each. 10 oz. Single Filling Duck.	Price Each. 10 oz. Double Filling or 8 oz. Army Duck.	Price Each. 12 oz. Double Filling or 10 oz. Army Duck.	Price Each. 12 oz. Army or No. 10 Duck.	Price Each. 15 oz. Army or No. 8 Duck.
6 x 6	5	7	9.00	10.50	12.00	14.00	15.50	20.00
7 x 7	6	8	13.50	15.50	18.00	20.50	23.50	29.50
9½ x 9½	6	9	18.50	22.00	25.50	29.00	33.00	42.00
12 x 12	6	10	27.50	32.00	36.50	41.50	46.50	58.50
14 x 14	6	11	39.00	42.00	47.50	54.50	61.50	76.00
16½ x 16½	6	12	45.00	52.50	59.50	68.00	76.00	95.00
19 x 19	6	13	53.50	62.00	70.50	80.50	90.00	113.00
21 x 21	6	13	76.00	86.50	97.00	109.00	121.00	149.00
23½ x 23½	6	14	89.50	101.50	113.50	128.00	142.00	174.50
26 x 26	6	15	103.00	117.00	131.00	147.50	164.00	201.00
28 x 28	6	15	115.00	130.50	146.00	164.50	182.50	224.50
30 x 30	6	16	129.00	146.50	164.00	184.50	205.00	252.00
33 x 33	6	17	146.00	166.00	186.00	209.00	232.50	285.00

Add 5 per cent for each foot or fraction thereof in extra height of wall.

In case tents are wanted with Awning Extension, as cut shows, add \$1.50 net to above prices. In this case walls are sewed fast to top.

AMAZON TENTS

These tents are a comfortable and convenient style for small camping parties.

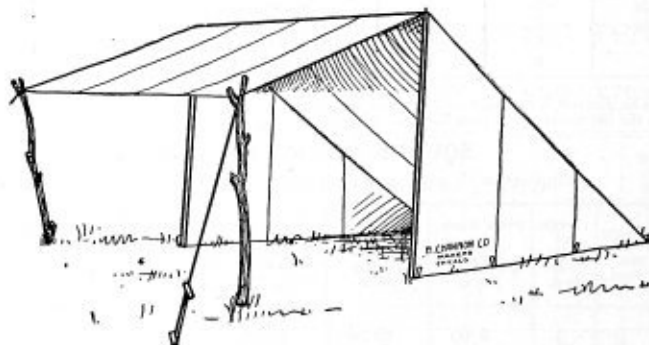


Prices given below are for tents complete with poles and pins, but without flies. Flies are listed at 50 per cent of tents of corresponding size.

Size, Feet.	Height of Wall, Feet.	Height of Center, Feet.	8-oz. Single Filling Duck.	10-oz. Single or 8-oz. Double Filling Duck.	10-oz. Double or 12-oz. Single Filling Duck.	12-oz. Double Filling Duck.
7x7	8	7	\$14.00	\$16.00	\$17.50	\$20.00
7x9	3	7	16.00	19.00	22.00	24.00
7x12	3	7	20.00	23.50	26.00	30.00
9x9	3	8	21.00	24.00	27.00	\$1.00
9x12	3	8	24.00	28.00	32.00	36.00
9x14	3	8	28.00	32.00	37.00	42.00
9x16	3	8	32.00	37.00	42.00	48.00

Should poles not be desired a discount of 5 per cent may be taken from above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof must be added.

LUMBERMEN'S OR HERDERS' TENTS

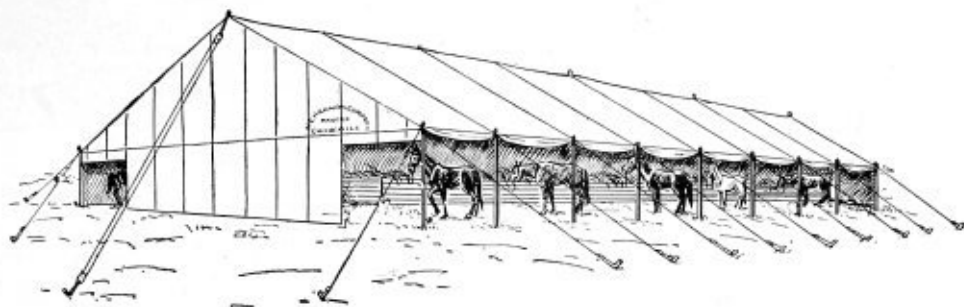


Prices given below are for tents complete with poles and pins.

Size, Feet.	Height of Poles, Feet.	8-oz. Single Filling Duck.	10-oz. Single Filling Duck.	10-oz. Double Filling or 8-oz. Army Duck.	12-oz. Double Filling or 10-oz. Army Duck.
9x9	7	\$ 8.75	\$10.50	\$12.25	\$14.00
9x12	7	10.25	12.30	14.35	16.40
9x14	7	11.85	14.20	16.50	18.90
9x16½	7	13.50	16.20	18.90	21.60
9x19	7	15.00	18.00	21.00	24.00
9x21	7	16.60	19.90	23.20	26.50
9x23½	7	18.25	21.90	25.55	29.20

Should poles not be desired a discount of 5 per cent may be taken from the above list prices.

STABLE TENTS



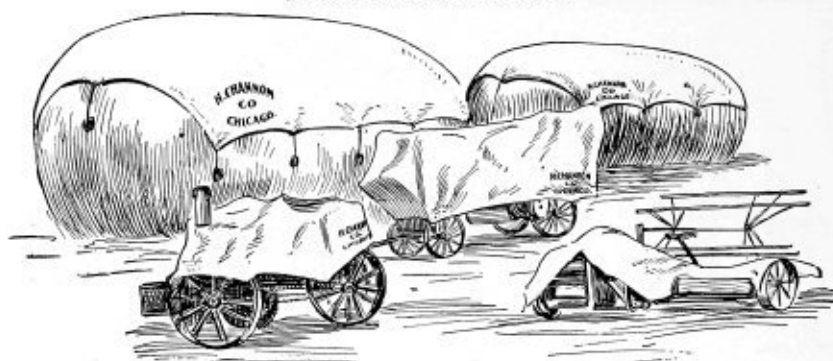
The prices given below are for tents complete with poles and pins, roped on ridges, eaves, gables every nine feet on the top.

Size.	Wall.	Pole.	10-oz. Double Filling, or 8-oz. Army Duck.	12-oz. Double Filling, or 10-oz. Army Duck.	12-oz. Army, or No. 10 Duck.	15-oz. Army, or No. 8 Duck.	Size.	Wall.	Pole.	10-oz. Double Filling, or 8-oz. Army Duck.	12-oz. Double Filling, or 10-oz. Army Duck.	12-oz. Army, or No. 10 Duck.	15-oz. Army, or No. 8 Duck.
24 x 24	5	12	\$104.00	\$117.00	\$130.00	\$160.00	28 x 25	5	13	\$170.75	\$192.25	\$213.50	\$262.25
24 x 32	5	12	112.00	126.00	140.00	172.00	28 x 37	5	13	179.25	201.50	224.00	275.25
24 x 38	5	12	127.00	143.00	159.00	195.00	28 x 42	5	13	196.50	221.25	245.75	302.00
24 x 33	5	12	142.00	160.00	178.00	218.50	28 x 47	5	13	213.50	240.00	266.75	327.50
24 x 35	5	12	150.00	169.00	187.50	230.50	28 x 51	5	13	230.25	259.00	287.75	353.50
24 x 37	5	12	157.50	177.00	196.50	241.50	28 x 56	5	13	247.50	278.50	309.50	380.00
24 x 42	5	12	173.00	194.50	216.50	265.50	28 x 60	5	13	265.00	298.00	331.00	406.75
24 x 47	5	12	188.50	212.50	236.00	290.00	28 x 63	5	13	273.75	308.00	342.25	420.50
24 x 51	5	12	204.50	230.00	255.50	314.00	28 x 65	5	13	281.75	317.00	352.00	433.00
24 x 56	5	12	219.50	247.00	274.50	337.00	28 x 70	5	13	298.50	336.00	373.00	458.50
24 x 60	5	12	234.50	264.00	290.50	360.50	28 x 72	5	13	307.50	346.00	384.50	472.00
24 x 63	5	12	242.00	272.00	302.50	371.50	28 x 75	5	13	315.00	354.50	394.00	484.00
24 x 65	5	12	250.00	281.00	312.00	383.50	28 x 82	5	13	341.00	383.50	426.00	524.00
24 x 70	5	12	265.00	298.00	331.00	407.00	28 x 84	5	13	353.00	397.00	441.00	542.00
24 x 72	5	12	273.50	307.50	341.50	419.50	28 x 91	5	13	375.00	422.00	469.00	570.00
24 x 75	5	12	280.50	315.50	350.50	431.00	28 x 94	5	13	391.50	440.50	489.50	601.00
26 x 21	5	12 1/2	111.50	125.50	139.50	171.00	28 x 100	5	13	416.50	469.00	521.00	640.00
26 x 24	5	12 1/2	130.00	135.00	150.00	184.00	30 x 21	5	14	130.00	146.00	162.50	199.50
26 x 28	5	12 1/2	135.50	152.50	169.50	208.00	30 x 24	5	14	139.00	156.00	173.50	213.50
26 x 33	5	12 1/2	152.00	170.50	189.50	233.00	30 x 28	5	14	161.50	181.50	201.50	247.50
26 x 35	5	12 1/2	159.50	179.50	199.50	245.00	30 x 33	5	14	176.00	198.00	220.00	270.00
26 x 37	5	12 1/2	168.00	189.00	210.00	258.00	30 x 35	5	14	184.00	207.50	230.50	283.00
26 x 42	5	12 1/2	184.00	207.50	230.50	283.00	30 x 37	5	14	193.00	217.50	241.50	296.50
26 x 47	5	12 1/2	200.50	225.50	250.50	308.00	30 x 42	5	14	211.00	237.50	264.00	324.00
26 x 51	5	12 1/2	216.00	243.00	270.00	332.00	30 x 47	5	14	229.00	257.50	286.50	351.50
26 x 56	5	12 1/2	232.50	261.50	290.50	357.00	30 x 51	5	14	247.00	278.00	308.50	379.50
26 x 60	5	12 1/2	248.50	279.00	311.00	382.00	30 x 56	5	14	265.50	298.50	332.00	407.50
26 x 63	5	12 1/2	257.00	289.00	321.50	394.50	30 x 60	5	14	283.50	319.00	354.00	435.00
26 x 65	5	12 1/2	264.50	297.50	330.50	406.00	30 x 63	5	14	292.50	329.00	365.50	449.00
26 x 70	5	12 1/2	281.00	316.50	351.50	431.50	30 x 65	5	14	301.50	339.00	376.50	462.50
26 x 72	5	12 1/2	289.00	325.00	361.00	444.00	30 x 70	5	14	320.00	359.50	400.00	491.00
26 x 82	5	12 1/2	327.00	374.00	414.00	456.00	30 x 72	5	14	328.00	369.00	410.00	504.00
26 x 84	5	12 1/2	321.00	361.00	401.00	493.00	30 x 75	5	14	337.50	380.00	422.00	518.50
26 x 91	5	12 1/2	359.50	370.50	411.50	506.50	30 x 82	5	14	364.00	409.50	455.00	559.00
28 x 21	5	13	119.75	134.75	149.75	184.00	30 x 84	5	14	373.00	419.50	465.00	573.00
28 x 24	5	13	128.25	144.25	160.25	197.00	30 x 91	5	14	399.50	449.00	499.00	613.00
28 x 28	5	13	145.00	163.25	181.25	222.75	30 x 93	5	14	418.00	470.00	522.00	641.50
28 x 33	5	13	163.00	183.25	203.25	250.25	30 x 100	5	14	445.00	501.00	556.50	683.50

Should poles not be desired a discount of 5 per cent may be taken from above list prices. Should higher walls be desired than specified in the list above 5 per cent for each additional foot or fraction thereof must be added.

PLAIN WHITE CANVAS PAULINS

For covering harvesters, binders, threshing machines, stacks, hay, cars, wagons and all kinds of merchandise.



Size in feet.	8-oz. Single Filling Duck	10-oz. Single Filling Duck	12-oz. Single Filling Duck	12-oz. D'ble Filling Duck	13-oz. or No. 10 Duck.	15-oz. or No. 8 Duck.	18-oz. or No. 6 Duck.	20-oz. or No. 4 Duck.
5½ × 9	.....	.....	.....	.....	\$ 3.80	\$ 4.20	\$ 4.80	\$ 5.10
5½ × 12	.....	.....	.....	.....	5.05	5.60	6.40	6.95
7 × 12	.....	.....	.....	.....	6.45	7.15	8.15	8.70
7 × 15	\$ 2.90	\$ 3.65	.....	.....	8.05	8.95	10.15	10.85
10 × 16	3.90	4.80	\$ 7.00	\$ 7.98	12.30	13.60	15.50	16.55
10 × 17	4.15	5.10	7.50	8.47	13.05	14.45	16.45	17.60
10 × 18	4.40	5.40	8.00	9.00	13.80	15.30	17.40	18.60
12 × 14	4.25	5.25	7.50	8.66	12.90	14.30	16.25	17.35
12 × 16	5.00	6.00	8.90	9.94	14.75	16.35	18.55	19.85
12 × 18	5.50	6.75	10.00	11.17	16.55	18.35	20.90	22.30
12 × 20	6.15	7.50	11.00	12.45	18.40	20.40	23.20	24.80
14 × 16	6.50	7.95	10.75	11.95	17.20	19.05	21.65	23.15
14 × 18	7.30	8.95	12.00	13.44	19.35	21.40	24.35	26.05
14 × 20	8.15	9.95	13.40	14.93	21.50	23.80	27.10	28.95
14 × 22	8.95	10.95	14.75	16.43	23.60	26.20	29.80	31.80
14 × 24	9.75	11.95	16.20	17.92	25.75	28.55	32.50	34.75
16 × 16	7.45	9.10	12.35	13.65	19.65	21.75	24.75	26.45
16 × 18	8.35	10.25	13.80	15.36	22.10	24.50	27.85	29.75
16 × 20	9.30	11.35	15.40	17.07	24.55	27.20	30.95	33.10
16 × 22	10.20	12.50	16.85	18.77	27.00	29.95	34.00	36.40
16 × 24	11.15	13.65	18.40	20.48	29.45	32.65	37.15	39.70
16 × 26	12.05	14.80	20.00	22.19	31.90	35.35	40.20	43.00
16 × 28	13.00	15.90	21.40	23.89	34.35	38.10	43.30	46.30
16 × 30	13.95	17.05	23.00	25.60	36.80	40.80	46.40	49.60
18 × 20	10.45	12.80	17.25	19.20	27.60	30.60	34.80	37.20
18 × 22	11.50	14.05	19.00	21.12	30.35	33.65	38.30	40.90
18 × 24	12.55	15.35	20.65	23.04	33.10	36.75	41.75	44.65
18 × 26	13.60	16.60	22.40	25.06	35.90	39.80	45.25	48.35
18 × 28	14.65	17.90	24.10	26.88	38.65	42.85	48.75	52.10
18 × 30	15.65	19.20	25.80	28.80	41.40	45.90	52.20	55.80
18 × 32	16.70	20.45	27.50	30.72	44.15	48.95	55.70	59.50
18 × 36	18.80	23.00	31.00	34.56	49.70	55.10	62.65	66.95
18 × 38	19.85	24.30	32.70	36.48	52.45	58.15	66.10	70.70
18 × 40	20.90	25.60	34.40	38.40	55.20	61.20	69.60	74.40
20 × 24	13.95	17.05	23.00	25.60	36.80	40.80	46.40	49.60
20 × 30	17.40	21.30	28.75	32.00	46.00	51.00	58.00	62.00
20 × 36	20.90	25.55	34.40	38.40	55.20	61.20	69.60	74.40
20 × 40	23.20	28.40	38.20	42.67	61.35	68.00	77.35	82.65
24 × 30	20.90	25.55	34.50	38.40	55.20	61.20	69.60	74.40
24 × 36	25.10	30.70	41.50	46.08	66.25	73.45	82.50	89.30
24 × 40	27.85	34.10	46.00	51.20	73.60	81.60	92.80	99.20
24 × 50	34.80	42.60	57.50	64.00	92.00	102.00	116.00	124.00

For hand sewed covers add 12½ per cent to the above list prices.

WAGON COVERS



We make up wagon covers of any size or shape desired. All our wagon covers are made with brass grommets and ropes spliced in the grommets. Lettered when desired.

Our Achilles Flax Wagon Covers are absolutely waterproof and the strongest and most durable covers made. We import this Flax direct from Belgium, and so far as our observation extends we have never found anything to compare with it. It is specially treated with a preparation which makes it water-repellant, and at the same time does not harden the material. It stays soft and pliable, and wears like iron. Is specially suitable for the center portion of large truck covers.

Price, per square foot\$0.20

Waterproof Wagon Covers Made of Gulls-wing Duck

The material from which these covers are made is specially prepared for us, and for medium priced water-repellant covers, they are the best we have ever seen. They are especially suitable for cement, sidewalk and construction covers.

Price, per sq. ft.

10 oz., white Gulls-wing	\$0.09
12 oz., white Gulls-wing .....	.10
10 oz., brown Gulls-wing .....	.10
12 oz., brown Gulls-wing, 72 in. wide..	.11

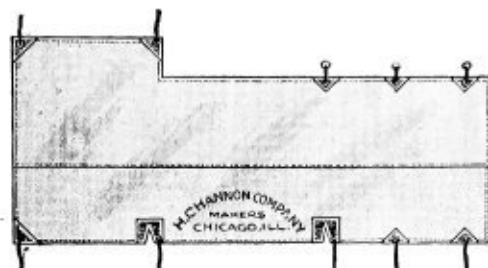
Heavy Wide Duck Wagon Covers

Price, per sq. ft.

20 oz.	\$0.14
18 oz. ....	.10
15 oz. ....	.09
13 oz. ....	.08

PERFECT FIT BINDER COVERS

To Fit Any Machine



7-oz.	price each, \$2.50
8-oz.	" " 3.00
10-oz.	" " 3.50

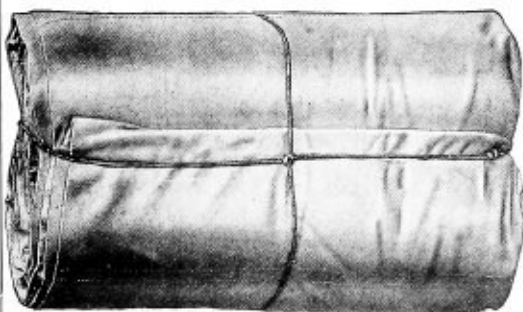
PAINTERS' DROP CLOTHS

We have constantly on hand a large stock of duck and drill suitable for use as drop cloths, and very often have bargains to offer in this line.

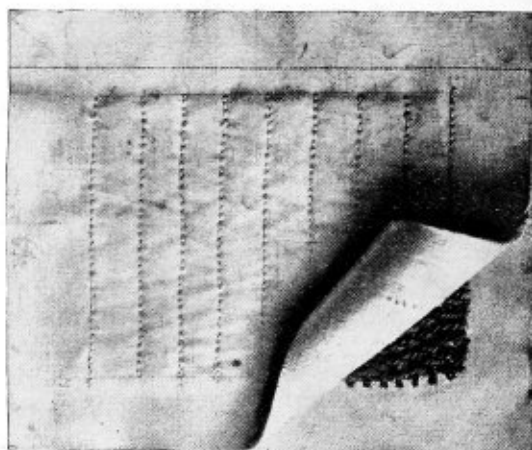
Prices quoted on application.

OLD CANVAS

Used for Brattice in Mines, Etc.

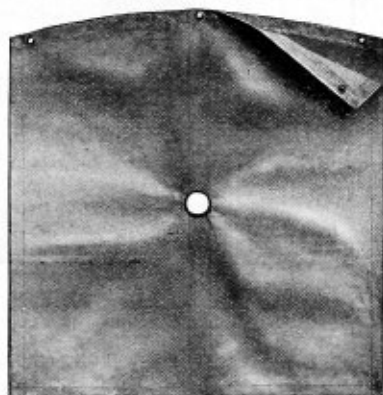


Usually cut 36, 54, 60 or 72 inches, but we can furnish any width desired. The weight is usually equal to a No. 2 duck. It is clean and odorless and much preferable to the imported brattice cloth, which reeks of fish oil, etc. Per square foot, \$0.06½.

FILTER CLOTHS FOR GOLD AND SILVER MINES

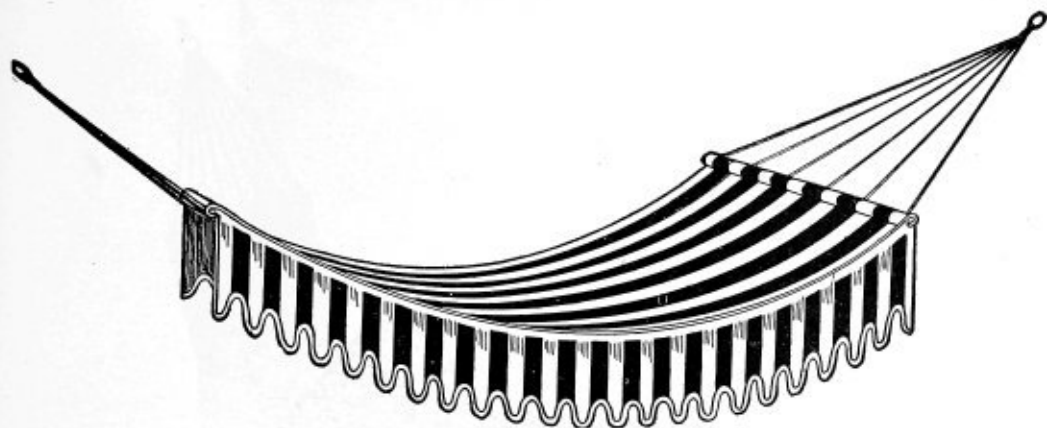
We have been making Filter Cloths and Bags for mining companies all over the world, and have special factory equipment to make them any size, style or shape desired. These filter cloths are usually made of No. 4, No. 6, or No. 8 Duck, with an interlining of Cocoa Matting (as shown in cut), or of the plain duck securely stitched with heavy linen thread in transverse seams $1\frac{1}{2}$ inches to 2 inches apart, according to the requirements of the frames.

We guarantee all cloths to be satisfactory, and to conform with your given specifications. We will gladly quote prices at your request, and be sure to give us size and all general specifications. We can make your filter cloths better and cheaper than you can in your plant, owing to our special equipments, and a trial order will convince you of this fact.

**SPECIAL FILTER CLOTHS FOR POTTERIES, PACKING HOUSES,
AND PAINT MANUFACTURERS**

These Cloths are usually made of light weight Duck, 10-ounce Double Filling Duck being most generally used, and here again we have every facility for making Filter Cloths exactly suited for your Filter Press work. Made as shown in cut, or according to your specifications.

All prices quoted on request.

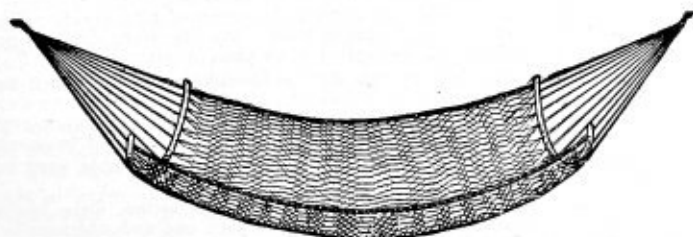
"SOLID COMFORT" CANVAS HAMMOCK

Our "Solid Comfort" Hammocks are just what the name implies. The design and construction are entirely our own, and the finish throughout is first-class. To insure the greatest possible amount of strength and comfort we use a heavy grade of canvas, and use extra wide spreaders, which are made up especially for us. Heavy cotton ropes and rings, as shown in cut. Will be found superior in every respect to the ordinary hammocks sold on the market. Must be seen to be appreciated.

	Per Dozen
No. 1. Made of fancy duplex striped canvas with full valance.....	\$20.00
No. 1A. Made of fancy duplex striped canvas, no valance.....	16.00
No. 2. Made of fancy champion striped canvas, blue or brown, full valance.....	18.00
No. 2A. Made of fancy champion striped canvas, blue or brown, no valance.....	14.00
No. 3. Made of plain white canvas, no valance.....	11.50

MEXICAN SEA GRASS HAMMOCKS

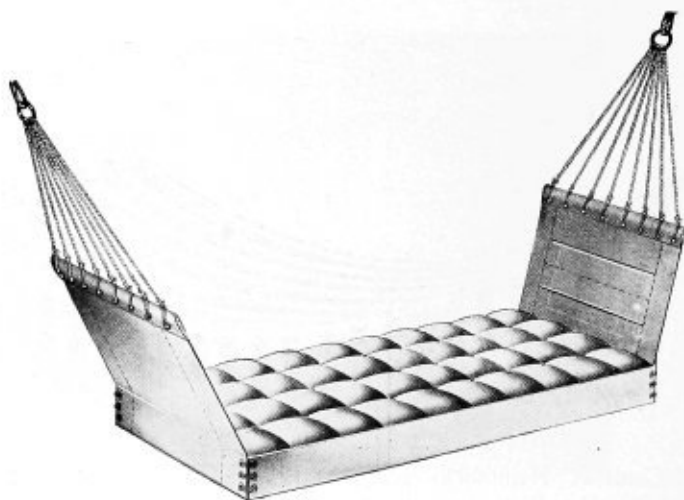
Without Valance



The old reliable woven hammock. Very strong and durable.

No. 260. White, 14 feet over all, woven edge, clinch thimbles.....	\$1.75
No. 261. Colored, 14 feet over all, woven edge, clinch thimbles.....	2.00

"DREAMLAND" SWAYING HAMMOCK COUCH



The "Dreamland" Swaying Hammock Couch is the most perfect and serviceable hammock ever devised. It combines all the points of excellence found in both the hammock and couch, permits of self-conformation to every curve of the body, without any unnatural position and is irresistibly inviting for refreshing sleep or restful lounging. For Porches, Camps, Bungalows, Dens or Cozy Corners, as a Hammock, a Couch or as a Bed for open air sleeping, it is exactly what is needed. The hammock is suspended by two ropes, which support the weight perfectly.

The hammock proper consists of a canvas body, extra heavy and double thickness, inside of which is placed a wooden frame interlaced with rope. The canvas is extremely strong and serviceable and doubly reinforced on the sides and at the ends. This is the strongest construction ever put into a canvas hammock—it will never sag—never tear—never overturn. There are no seams to come loose—no eyelets to tear out—no facings to break—nothing to get out of order. It is practically indestructible and really is the most economical hammock one can buy.

The mattress is made of a fine grade cotton felting, heavily tufted and side stitched. Fits very snugly and is easily removed.

The canvas body rolls up into a very light compact bundle for storage or transportation.

A strong steel wire spring fitted for the frame can be furnished at a slight advance in cost. This adds much to the value of the hammock by making it as comfortable and easy as any couch.

A wind shield can be furnished for one or both sides of the hammock. This is attached with buckles and protects one from cold wind or prevents small children from falling out.

The "Dreamland" Hammock Couch can be swung by ropes attached to a porch ceiling or to the branch of a tree, but a suitable place to suspend it is not always at hand. We therefore make a **portable iron frame** nicely finished in aluminum bronze, which is easily carried from place to place.

A portable wood frame with metal fixtures can also be furnished, which is much lighter in weight and at the same time very strong and rigid.

For open air sleeping, nothing can surpass the "Dreamland" hammock fitted with our **Tent Top**. (Shown on opposite page.) It is more comfortable, more hygienic, more restful, and in every way far superior to any couch or cot used for outdoor sleeping. When inside, one is as comfortable, snug and as well protected from wind, rain, dampness or insects as in a well appointed tent.

The tent top is made of a heavy grade of fine drill in either white, brown, slate, khaki or green color to match the body of the hammock. It is fitted with ventilators in each end and openings in the middle of each side covered with flaps, which can be rolled up and fastened by means of tapes sewed on to the flaps. These openings are covered with bobbinet to keep out all insects. The entire side can also be raised up to allow more air if desired.

All openings are equipped with regular glove fasteners. The tent top can be securely fastened underneath the hammock by means of strong tie tapes. Three jointed poles with brass ferrule sockets give the top a perfect tent shape.

See next page for Price List.

TENT TOP FOR "DREAMLAND" SWAYING HAMMOCK COUCH

For Outdoor Sleeping



PRICE LIST OF "DREAMLAND" SWAYING HAMMOCK COUCHES
Description on Opposite Page

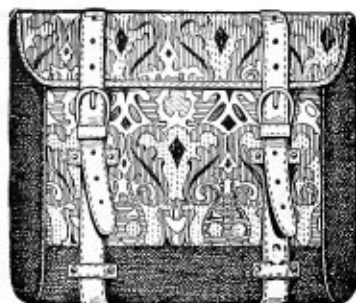
No.	Description	Price Each without Mattress	No.	Description	Price Each without Mattress
10	18 oz. White canvas without wind shield..	\$ 9.50	23-A	15 oz. Khaki canvas with one wind shield..	\$11.00
11	18 oz. Brown canvas without wind shield..	10.00	24-A	15 oz. Green canvas with one wind shield..	11.50
12	18 oz. Slate canvas without wind shield..	10.00	25-A	15 oz. Red canvas with one wind shield...	11.50
13	18 oz. Khaki canvas without wind shield..	10.00	20-B	15 oz. White canvas with two wind shields	12.50
10-A	18 oz. White canvas with one wind shield..	11.50	21-B	15 oz. Brown canvas with two wind shields	13.00
11-A	18 oz. Brown canvas with one wind shield	12.00	22-B	15 oz. Slate canvas with two wind shields	13.00
12-A	18 oz. Slate canvas with one wind shield..	12.00	23-B	15 oz. Khaki canvas with two wind shields	13.00
13-A	18 oz. Khaki canvas with one wind shield..	12.00	24-B	15 oz. Green canvas with two wind shields	13.50
10-B	18 oz. White canvas with two wind shields	13.50	25-B	15 oz. Red canvas with two wind shields..	13.50
11-B	18 oz. Brown canvas with two wind shields	14.00	30	13 oz. White canvas without wind shield..	7.50
12-B	18 oz. Slate canvas with two wind shields	14.00	31	13 oz. Brown canvas without wind shield..	8.00
13-B	18 oz. Khaki canvas with two wind shields	14.00	32	13 oz. Slate canvas without wind shield...	8.00
20	15 oz. White canvas without wind shield..	8.50	33	13 oz. Khaki canvas without wind shield..	8.00
21	15 oz. Brown canvas without wind shield..	9.00	30-A	13 oz. White canvas with one wind shield..	9.50
22	15 oz. Slate canvas without wind shield...	9.00	31-A	13 oz. Brown canvas with one wind shield	10.00
23	15 oz. Khaki canvas without wind shield..	9.00	32-A	13 oz. Slate canvas with one wind shield..	10.00
24	15 oz. Green canvas without wind shield..	9.50	33-A	13 oz. Khaki canvas with one wind shield	10.00
25	15 oz. Red canvas without wind shield....	9.50	30-B	13 oz. White canvas with two wind shields	11.50
20-A	15 oz. White canvas with one wind shield	10.50	31-B	13 oz. Brown canvas with two wind shields	12.00
21-A	15 oz. Brown canvas with one wind shield	11.00	32-B	13 oz. Slate canvas with two wind shields	12.00
22-A	15 oz. Slate canvas with one wind shield..	11.00	33-B	13 oz. Khaki canvas with two wind shields	12.00

The Above Prices Include Rope-Laced Frame; Mattress Extra

The mattress is made of a fine grade cotton felting heavily tufted and side stitched. Size 30 inches wide, 6 feet, 4 inches long, 4 inches high, weight 22 pounds. Colors green, slate, khaki, red or brown to match body of hammock. Each.....	\$ 6.00
The frame is made of fine birch stock, 1 1/4 inches thick, laced with rope. Extra for frame fitted with special wire spring.....	1.00
Special pillows, 18x26 inches, same colors as mattress, each.....	1.00
Tent top made of heavy grade of fine drill in either white, brown, slate, khaki, red or green color, to match body, each.....	8.00
Portable iron frame, each.....	12.00
Portable wood frame, each.....	12.00

Prices F. O. B. cars Chicago.

PLUMBERS' TOOL BAGS



Made of Brussels Carpet, Lined with Duck and Leather Bound.

No.	Style	Size, Inches	Price Each
100	Plain.....	18x26	\$3.50
102	Leather Bottom.....	18x26	4.25
103	Lthr. Bottom and Sides	18x26	5.00

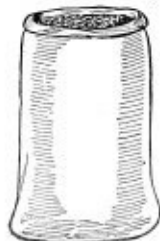
CANVAS MESSENGER SATCHELS
With Lock

Heavy White Cotton Duck, Hand Made Frame, Grain Leather Base, Heavy Strap Handles, Especially Designed for Hard Service.

No.	Size Frame, Inches	Price Each
62	14	\$3.00
63	16	3.25
64	18	3.50
65	20	4.00
66	22	4.50
67	24	4.75

ORE SACKS

For shipping valuable ores. Made of heavy cotton duck. Very strong and lasting.



No.	Size, Inches	Material Duck	Price Each
220	15 1/2 x 24	No. 10	\$0.40
221	15 1/2 x 24	" 9	.46
222	15 1/2 x 24	" 8	.42
223	17 1/2 x 24	" 8	.60
224	17 1/2 x 24	" 9	.54
225	17 1/2 x 24	" 10	.48

MASONS' TOOL BAGS



This bag is made of very heavy duck, sewed with strong twine (on a lock-stitch machine, cannot rip unless every thread is cut), has steel frame with lock and key, leather handles.

Cannot be excelled for quality, workmanship and durability.

Without Pocket

With Pocket

No.	Size, Inches	Price Each	No.	Size, Inches	Price Each
80	14	\$1.25	101	14	\$1.35
81	16	1.40	102	16	1.50
82	18	1.50	103	18	1.65
83	20	1.65	104	20	1.80
84	22	1.80	105	22	2.00
85	24	2.00	106	24	2.25

LINEMEN'S TOOL BAGS

Made of Heavy Canvas Sewed to a Steel Frame, with Leather Base. Heavy Straps Over Top.



No.	Size, Inches	Price Each	No.	Size, Inches	Price Each
86	14	\$3.00	89	20	\$4.00
87	16	3.30	90	22	4.50
88	18	3.50	91	24	5.00

LETTER CARRIERS' SATCHELS

Made of Leather or Colored Canvas.
Size, 15x16 inches.



No.	Material	Price Each
40	Leather	\$5.00
41	Canvas	3.50

CARRY-ALL BAGS



Made of Brown Cotton Duck and Leather Bound, with Leather Handles.

Nos. 16 and 17 have Leather Flap with Strap to Lock

No.	Material	Size Inches	Price Each
15	10 oz. Duck	20 x 27	\$3.00
16	24 " "	22 x 31	4.50
17	24 " "	24 x 36	5.00

OFFICE MAIL BAGS All Leather



No.	Size Inches	Price Each
1	10 x 13	\$3.50
2	12 x 15	4.00
3	14 x 17	4.50
4	15 x 20	5.25
5	16 x 24	6.00
6	18 x 26	6.50

Lock, 25c. extra net.



LEATHER HAND BAGS For Office Mail



No Lock

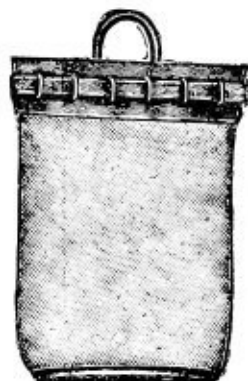
No.	Size Inches	Price Each
13	10 x 10	\$2.50

CANVAS HAND BAGS

With Leather Bottom and Leather Welt on Sides.

No.	Size Inches	Price Each
7	10 x 13	\$3.00
8	12 x 15	3.50
9	14 x 17	3.75
10	15 x 20	4.25
11	16 x 24	5.00
12	18 x 26	5.50

Lock, 25c. extra net.



MAIL POUCHES

All Leather, or Canvas with Leather Bottom, made same as U. S. Mail Pouches.

No.	Size Inches	Price Each	
		All Leather	Canvas with Leather Bottom
20	16 x 26	\$ 7.00	\$ 6.25
21	18 x 30	8.50	7.25
22	20 x 36	9.75	8.25
23	24 x 42	11.50	9.25
24	30 x 48	13.00	10.25

H.Channon Company. Chicago.

BOND BAGS



Frame Leather Covered and Sewed, Striped Duck Lining with Inside Pocket, Leather Base.

No.	Size Frame	Price Each	No.	Size Frame	Price Each
51	10 inches	\$3.50	56	18 inches	\$5.00
52	12 "	3.75	57	20 "	5.25
53	14 "	4.25	58	22 "	5.50
54	16 "	4.50	59	24 "	6.00

SHELL BAGS



Leather Bound, with Shoulder Strap and Piece.

No.	Material	Capacity Shells	Price Each
130	8 oz. Duck	50 to 100	\$0.50
131	10 " "	50 " 100	.75
132	10 " "	100 " 200	1.00
133	15 " Army Duck	50 " 100	.75
134	Russet Grain Leather	50 " 100	2.00

HAVERSACKS

Made of White or Colored Cotton Duck, Leather Bound.

No.	Size Inches	Price Each
70	14	\$1.75
71	16	2.00
72	18	2.25



CANVAS MAIL SACKS



With Patent Metal Fastener, made same as those used by U. S. Mail Service.

No.	Size, Inches	Price Each
1	36 x 42	\$2.00

SCHOOL BAGS



No. 10. Per doz.
No. 10 Waterproof School Bags made of Enameled Cloth with flap and leather shoulder strap; 15 in. long.....\$ 7.50

No. 12 Leather School Bags, unlined with flap and shoulder strap; 16 in. long.....11.50

No. 14 Leather School Bags lined with cloth, flap and leather shoulder strap; 16 in. long.13.00

No. 9 Boys' Army Duck School Bags, bound and stitched all around, flap fastens with two buckles and straps, grain leather shoulder strap with buckle, 15 in. long. Per doz.\$ 4.00

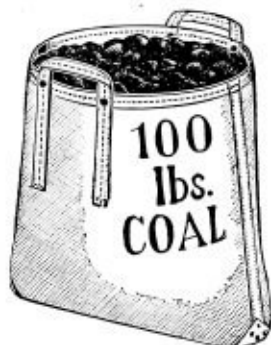
No. 11 School Bags Colored Duck, bound and stitched all around, flap fastens with buckle and strap, leather shoulder strap with buckle; 15 in. long. Per doz..... 3.50



COAL BAGS



Made of No. 4 duck, finished with leather handles.
No. 215. Price each.....\$0.75



Made of No. 4 duck, finished with canvas handles extending about six inches down the side.
No. 216. Price each.....\$0.85

COAL BAGS

Double Bottom, Special Reinforced



This is One of the Most Durable Bags We Manufacture

The handles are reinforced and extend clear around the bag. Bag has handles set low on the sides to make it easy to empty. This is a feature worth considering. The bag is made of No. 4 duck with 12 oz. D. F. double bottom. Strongly sewn and reinforced at the corners.
No. 217. Price each.....\$1.00

CANVAS APRONS



Carpenter's



Mechanic's

Made of heavy white or brown duck. Long pattern to reach below the knees. Large pocket on front, adjustable neck supporters. Mechanics' are divided so as not to interfere with walking.

Carpenter's

	Per doz.
No. 3—8-oz., brown duck.....	\$3.60
No. 5—8-oz., white duck.....	3.40

Mechanic's

	Per doz.
No. 4—8 oz., brown duck.....	\$4.10
No. 6—8 oz., white duck.....	3.90

NEWSPAPER BAGS

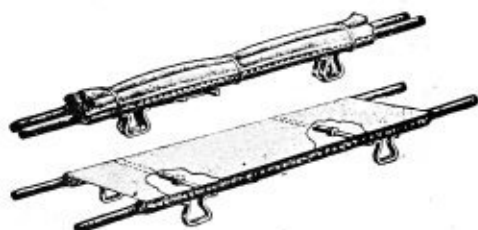


No.	Size, Inches	Material, Duck	Price Each
110	12x15	8 oz. White	\$0.40
111	12x15	10 " "	.46
112	12x15	8 " Brown	.44
113	12x15	10 " "	.50

We can make any other size or of any weight of duck. We will quote upon application.

THE AMERICAN LITTER

Used by the United States Army



Description

OPEN, 21½ inches wide.

CLOSED, 4 inches wide.

LENGTH, 7½ feet.

WEIGHT, 21 pounds.

HANDLES of 2x1½ inch ash, rounded ends, filled and varnished.

FEET of 1½x3/16-inch steel, galvanized.

BRACES of ¾x¼-inch steel, galvanized with painted lugs.

CANVAS of No. 10 drab or brown color, 6 feet in length, tacked on handles every inch apart.

Each litter is provided with three leather straps for folding up, also with two blue webbing shoulder straps.

Price each \$10.00

SOLID BLOCK CORK LIFE PRESERVERS

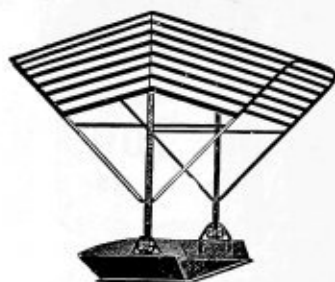


These preservers are made in accordance with the rules and regulations of the United States Board of Supervising Inspectors. The buoyancy will average at least 25 per cent. above the 24 lbs. required by law. Each preserver is inspected and stamped by a United States inspector before leaving factory.

Price each \$1.00

"Never-Sink" Cork Jackets.....each 1.35

THREE-BOW SEAT SHADES



With all irons to attach to seat. Send outside measurements, on top.

Price, per dozen.....\$36.00

SIX RIB UMBRELLA



Covered with heavy duck in blue, brown, white or green.

Price, including wagon fixtures.....
Per Dozen.....\$24.00

FEED BAGS



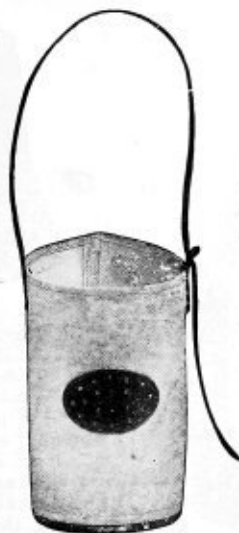
No. 1 Feed Bag.

Made of heavy spliced duck. Large wood bottom of carefully selected hardwood. Rope head strap.
Price, per dozen.....\$4.00



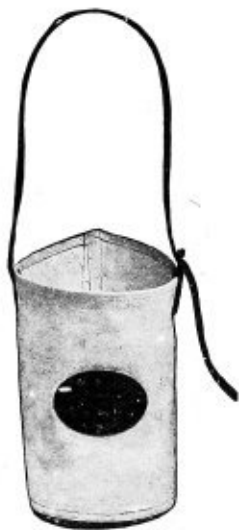
No. 2 Feed Bag.

Made of heavy spliced duck. Leather bottom and ventilator. Leather head strap.
Price, per dozen.....\$7.00



No. 3 Feed Bag.

Made of No. 10 duck. Large leather bottom and ventilator. Leather head strap.
Price, per dozen.....\$10.00



No. 4 Feed Bag.

Made of No. 8 heavy duck. Large leather bottom and ventilator. Four-foot leather head strap.
Price, per dozen.....\$11.00

FEED BAGS



No. 5 Feed Bag.

Half leather feed bag, heavy duck top. Four foot leather head strap. A strong and durable bag.

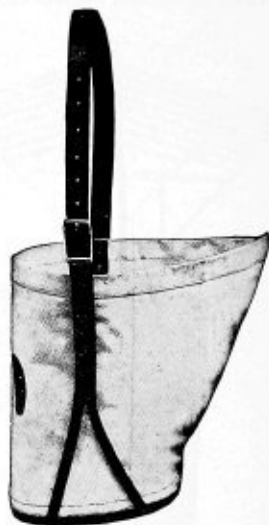
Price, per dozen.....\$18.00



No. 7 Feed Bag.

Made of 12-ounce double filling duck. Large leather bottom and ventilator. Leather head strap. A serviceable bag.

Price, per dozen.....\$7.20



No. 6 Feed Bag

Montana feed bag. Large oval Goodyear leather bottom and strap. Large ventilator, heavy duck top. The best bag made for hard service.

Price, per dozen.....\$24.00

SANITARY FEED BAGS



Right Side Out.



Made in Three Styles, each with a Strong Wooden Bottom, which is Fastened to Bag by a Heavy Wire Fitting into Groove in the Edge. The

Bag Can Easily Be Turned Wrong Side Out and Washed.

No.	Material	Style	Price per Doz.
10	12oz. D. F.	All Canvas, with Rope Head Strap	\$4.00
20	12 " "	All Canvas, with Leather Head Strap	7.00
30	No. 6 Duck	Half Leather, Half Canvas, with Leather Head Strap	16.00

UNITED STATES FLAGS

Our Peerless Brand

Made of Best Wool Bunting, with a Full Complement of Stars Sewed on Each Union

STANDARD LIST



(Standard Sizes.)

Size, Feet			Price Each	Size, Feet			Price Each	Size, Feet			Price Each	Size, Feet			Price Each
Length	Width			Length	Width			Length	Width			Length	Width		
3	2		\$.95	10	6		\$ 6.00	16	8		\$11.70	24	12		\$25.00
4	2½		1.40	11	7		7.80	16	9		13.20	24	15		30.00
5	3		2.25	12	6		7.50	16	10		14.00	24	16		32.00
6	3		2.70	12	7		8.40	18	9		14.70	25	12½		26.75
6	4		3.15	12	8		9.00	18	10		16.00	25	15		31.00
7	4		3.50	14	7		9.35	18	12		18.70	26	16		34.00
8	4		3.95	14	9		11.50	20	10		17.75	27	18		40.00
8	5		4.45	15	8		10.90	20	12		20.50	30	15		37.40
9	5		5.15	15	9		12.30	22	11		21.00	30	20		48.00
9	6		5.70	15	10		13.40	22	12		22.80	36	20		57.50
10	5		5.60	..	..		.....	..	..		.....	..	..		.....

We sew a complete number of stars on each union except in the three and four foot sizes, which have but thirteen.

U. S. Flags

(Government Sizes.)

Length, Feet	Price Each	Length, Feet	Price Each	Length, Feet	Price Each	Length, Feet	Price Each
2	\$1.60	6	\$ 6.40	10	\$12.80	25	\$ 64.00
2½	2.40	7	8.00	12	19.20	30	96.00
3	3.20	8	9.60	15	25.60	36	120.00
4	4.00	9	11.20	18	36.00	40	160.00
5	4.80	..	.....	20	48.00	..	.....

These flags are made in strict accordance with the U. S. Government specifications and are about two-thirds as great in width as in length.

Wool Bunting Procession Flags

U. S. Army Regulation.

Size, Feet	Flag Only, Price Each	Flag complete, with Pole, Spear Head, Cord, Cover, Boot and Strap, Price Each	Flag complete, with Jointed Pole, Brass Eagle, Cover and Patent Leather Boot, Price Each	Extra for Lettering Price Per Letter
4½ x 5½	\$3.50	\$11.00	\$14.50	\$0.50
6 x 6½	4.50	13.50	17.00	.50

YACHT ENSIGNS



Made of the Best Wool Bunting, with 13 Stars and Anchor Sewed on Each Union

Length, feet	Width, feet	Price Each
3	2	\$1.70
4	2½	2.20
5	3	2.50
6	4	3.50
7	4	4.00
8	5	5.00

UNITED STATES SILK FLAGS



Silk Flags

Machine Sewed, with Machine Embroidered Stars.

Size, Feet.	Made of Flag Silk, Price Each.	Made of Banner Silk, Price Each.
2 x 3	\$ 9.00	\$10.50
2½ x 4	10.50	16.00
3 x 5	15.00	24.00
4 x 6	20.00	33.00
4½ x 7	24.00	40.00
5½ x 6	30.00	45.00
5 x 7	30.00	45.00
5 x 8	33.00	48.00
6 x 9	46.00	66.00
6 x 10	50.00	72.00
6 x 12	55.00	80.00
8 x 12	70.00	90.00

UNITED STATES PENNANTS



Made of the Best Wool Bunting, with 13 Stars Sewed on Each Union

Length, Feet	Price Each, 6 Inches at Head	Price Each, 9 Inches at Head	Price Each, 12 Inches at Head	Price Each, 18 Inches at Head
8	\$1.60	\$1.80	.....	.....
10	2.00	2.30	\$2.60	\$4.20
15	2.50	2.90	4.35	5.20
20	3.00	3.40	4.90	6.00
25	3.30	3.60	5.20	6.60
30	3.50	3.80	5.50	7.20

Printed Silk

Size Inches.	Unmounted, Price Per Doz.	Mounted, Price per Doz.	Mounted and Fringed, Price per Dozen
2x 3	\$ 0.60	\$ 0.75	.....
4x 6	1.35	1.65	\$ 3.00
6x 9	1.50	1.75	3.50
7x10	1.65	2.15	4.00
8x12	2.15	2.75	4.50
12x18	4.50	5.00	8.00
16x24	7.50	7.25	13.50
24x36	16.00	17.50	30.00
32x48	27.00	30.00	45.00
36x60	45.00	50.00	70.00

UNION JACKS



Made of the Best Wool Bunting, with a Full Complement of Stars

Length, Feet	Width, Feet	Price Each	Length, Feet	Width, Feet	Price Each
3	2	\$1.60	8	6	\$ 6.80
4	3	2.50	10	8	10.00
5	4	3.00	12	9	12.50
6	4½	3.80	15	12	20.00

UNITED STATES FLAGS

Printed Muslin.

Mounted on Sticks.

No	Size, Inches.	Price Per Gross.
1	2 x 3	\$ 0.27
2	2½ x 4	.32
3	4 x 6	.53
4	4½ x 7½	.72
5	6 x 9½	1.32
5½	7 x 10½	1.70
6	8 x 14	2.56
7	11 x 18	3.90
7½	12 x 22	5.00
8A	14 x 24	5.70
8	18 x 27½	8.00
9	20 x 36	13.80
10	27 x 43	20.00
11	30 x 50	26.20
11½	36 x 56	31.40
12	40 x 66	49.40
12½	40 x 72	60.80

GENUINE WOOL BUNTING BURGEES

Made in all Colors—Letters Sewed on



Nothing will advertise you so well, and help to give a better appearance to your place of business than a Burgee with your name thereon. For factories, business houses, hotels, and club houses, they are most popular and are coming into more general use every year.

Length, Feet.	Price for Burgee Only.	Extra for Each Letter	Length, Feet.	Price for Burgee Only.	Extra for Each Letter.
3	\$1.00	\$0.25	12	\$ 6.00	\$0.50
4	1.25	.25	15	8.50	.50
5	1.50	.40	18	11.00	.65
6	1.80	.40	20	13.00	.75
8	2.75	.40	25	24.00	.75
10	4.00	.40	30	30.00	1.00
..	....	....	36	42.00	1.00

We can make these Burgees any other size than those listed above, at proportionate prices. We can make them with different colored borders made of stars or without any borders at all, as preferred.

CHANNON FELT PENNANTS

Satin Ribbon
Trimmings

No. 1



No. 2



No. 3

Size	Each	Doz.
10x24	\$0.70	\$ 7.00
12x27	.90	9.00
12x36	1.00	10.00
18x36	1.25	12.00
24x48	2.00	20.00

For Designs Nos. 1 and 4
Add \$1.00 per Doz. Net



No. 4

We Make Any Design and Combination of Colors to Order

RAILROAD SIGNAL FLAGS

Made of the best Wool Bunting



Size, Inches.	Railroad Bunting, Price Per Dozen.	Best Wool Bunting, Price Per Dozen.
18x20	\$1.50	\$2.00
18x24	1.75	2.25

FLAG POLE HOLDERS

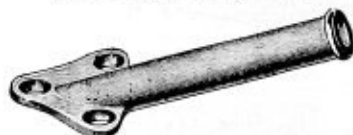
Malleable Iron, Galvanized



No.	Bore, Inches.	To Fit Poles, Feet in Length.	Price Each.
4	1 1/4	9	\$0.70
3	1 1/2	10	.80
2	1 3/4	12	.90
1	1 1/2	15	1.00

FLAG STAFF HOLDERS

Cast Iron, Galvanized



No.	Bore, Inches.	To Fit Poles, Feet in Length.	Price Each.
11	3/8	3	\$0.15
10	1/2	4	.20
9	5/8	5	.25
7	3/4	6	.35
6	1	7	.45
5	1 1/4	8	.50

FLAG POLES

Varnished, with Wooden Ball and Truck



Length, Feet.	Diameter, Inches.	Price Each.
8	1	\$0.75
9	1	.85
10	1 1/2	.90
12	1 1/2	1.10
14	1 1/2	1.70
16	1 1/2	2.25

FLAG POLES—HEAVY

One Piece Poles.

Length, Feet	Diameter		Price Each
	Base, inches	Top, inches	
12	3	1 1/2	\$ 4.50
16	4	2	5.00
20	4	2 1/2	7.00
20	6	2 1/2	9.00
25	4	3	9.00
25	6	3 1/2	12.50
30	6	3 1/2	16.00
30	8	3 1/2	22.00
35	6	4	22.00
35	8	4 1/2	28.00
40	8	4 1/2	35.00
40	10	4 1/2	46.00
45	8	5	46.00
45	10	5 1/2	52.00
50	8	5 1/2	52.00
50	10	4	68.00
55	10	4	75.00
60	10	4	85.00
60	12	4 1/2	100.00
65	12	4 1/2	115.00
70	12	5	135.00

Two-Piece Poles.

No.	Bore, Inches.	To Fit Poles, Feet in Length.	Price Each.
70	10	2 1/2	110.00
85	10	2 1/2	140.00
100	12	3	175.00
125	14	4	300.00
150	16	5	500.00

Fittings furnished with each flag pole consists of ball, truck, cord and cleat.

FLAG STAFFS

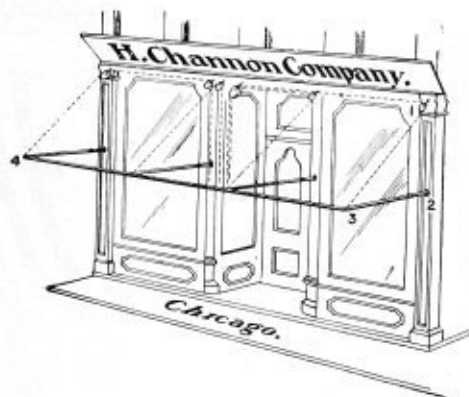
Varnished, with Wooden Spear Head



Length, Inches.	Diameter, Inches.	Price Per Dozen.
24	3/8	\$0.60
30	1/2	.72
36	1/2	.96
42	3/4	1.15
48	3/4	1.44
54	3/4	1.56
60	1	1.92
72	1	2.40
84	1 1/2	2.70
96	1 1/2	3.36
108	1 1/2	4.08
120	1 1/2	5.04

STORE AWNINGS

Directions for Measuring Store Awnings



First determine the place where the joints of awning frame will be fastened to building (see figure 2 on diagram), which should be from 7 to 8 feet from sidewalk. The curtain, which is usually 14 inches deep (figure 2), you will have to allow for in clearing people's heads. Then measure from where the joints fasten (figure 2) to where the awning will be fastened above the windows (see figure 1), which will give height of awning, or from 1 to 2.

The distance from 2 to 3, on a high building, should be the same as from 1 to 2; but on a low building it might be a little more.

The width of awning, or from 3 to 4, is obtained by measuring from center of outside column on one side to same on the other side.

If the top of window or door projects or sets back from face of building, mention how much.

When filling out order sheet, state if joints of frame fasten to iron, wood, brick or stone, and if door posts are in line with face of building or outside columns, also how many joints the frame requires.

Prices on Application

WINDOW AND DOOR AWNINGS

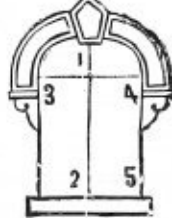
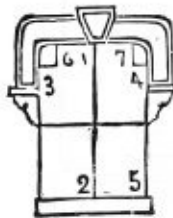
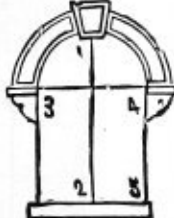
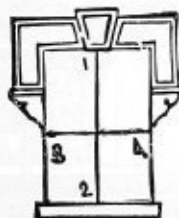
Directions for Measuring Window Awnings

No. 1 Window.

No. 2 Window

No. 3 Window

No. 4 Window.



SQUARE CORNERS.

SEMI-CIRCLE.

ROUND CORNERS.

SEGMENT.

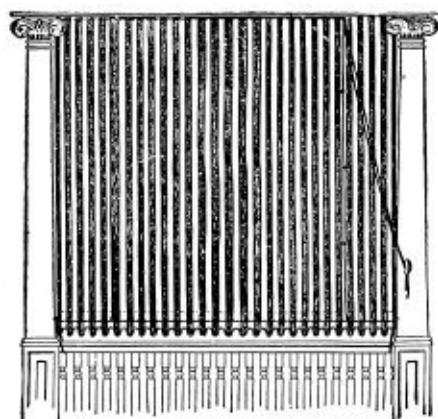
In ordering Window Awnings, give full size of window, measuring from center to center of casings (see diagrams).

Always state whether awnings are wanted for first story or stories above; if the former, state height from ground to window sills. Be particular to mention style of window (as per diagram) for which awning is wanted.

Prices on Application

Bieder Adjustable Porch Curtains

They are made in three sizes, are easily adjusted, easy to hang and will fit any porch.

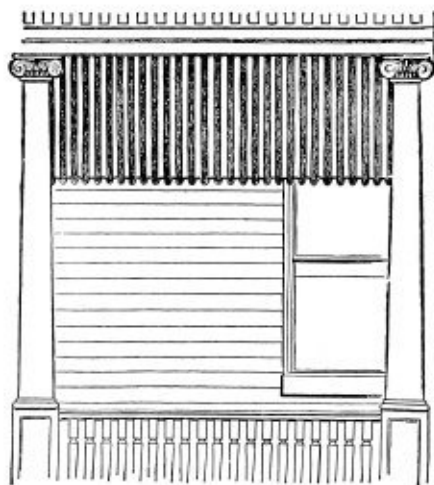


8-oz. Duplex, blue and white, or brown and white, adjustable frame, complete with pulleys, ropes, cleat, screws, galvanized fixtures, and full directions for hanging.

PER DOZ.

- No. 5 Adjustable, 4 ft. to 6 ft. wide, 76 in. high.. \$48.00
 No. 6 Adjustable, 6 ft. to 8 ft. wide, 76 in. high.. 60.00
 No. 7 Adjustable, 8 ft. to 10 ft. wide, 76 in. high.. 72.00

PORCH VALANCE



Made of blue and white, or brown and white Duplex Duck to match window awnings; 14 in. deep, and sold only in pieces 50 ft. long. This is intended to be cut from the piece in any length required.

No. 12 Porch Valance, 14 in. high, 50 ft. length (sold only in full pieces), each piece in burlap sack, per piece, 50 ft., \$6.00

Bieder Adjustable Window Awnings

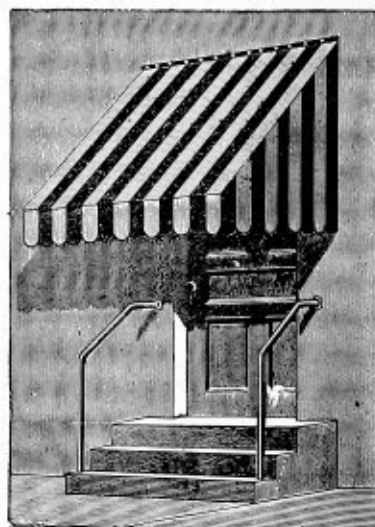
Fits all size windows—2 ft. 6 in. to 4 ft. wide. Made in one size only for all windows.



Looks exactly alike on large or small windows. Easily adjusted, easily hung. Price per doz..... \$36.00

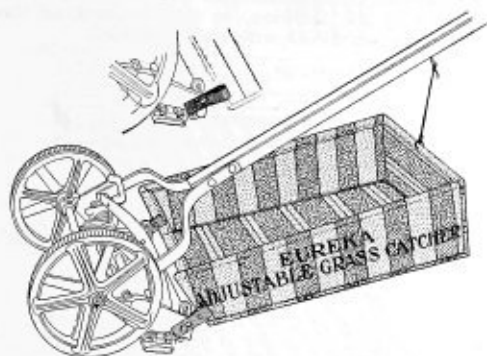
Bieder Adjustable Door Awnings

Are made adjustable same as Bieder Adjustable Window Awnings, and fit all size doors from 4 ft. to 6 ft. wide. They are made of the same duck as the window awnings, and adjust in the same manner.



No. 4 Bieder Adjustable Door Awnings, blue and white, or brown and white, adjustable frame, galvanized fittings, width adjustable from 4 ft. to 6 ft., length 60 in., projection 50 in., complete with pulleys, ropes, cleat, staples, screws, etc., and full directions for hanging. Each awning wrapped in cloth. Per doz..... \$72.00

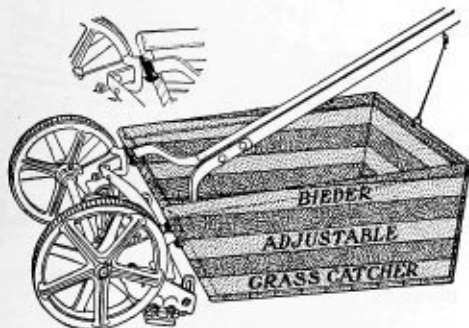
GRASS CATCHERS



Eureka



Carroll



Bieder

Eureka

Adjustable Grass Catcher

Made to meet the demand for a low-priced grass catcher.

Adjustable to all sizes and makes of low wheel mowers.

PER DOZ.

No. 1—Fits 12 to 18 inches inclusive, weight per doz. 17 lbs.\$8.00

No. 2—Fits 18 to 24 inches inclusive, weight per doz. 18 lbs. 9.00

Carroll

Adjustable Grass Catcher

Fastens to mower without the use of clamps.

The spring in the forward hem holds the Catcher securely to the mower. Easily removed for emptying—it is only necessary to spread the forward end.

Adjustable to fit all size mowers.

PER DOZ.

No. 1—Fits 12 to 18 inches inclusive, weight per doz. 18 lbs.\$10.00

No. 20—Fits 18 to 24 inches inclusive, weight per doz. 20½ lbs. 13.00

Bieder

Adjustable Grass Catcher

One of our best numbers.

Made extra deep to prevent grass being thrown over sides and rear. Will fit all sizes and makes of mowers.

Our unconditional guarantee is back of this Grass Catcher.

PER DOZ.

No. 7—Fits all low wheel mowers, 18 in. and smaller, weight per doz. 20 lbs.\$11.00

No. 13—Fits all high wheel mowers, 24 in. and smaller, weight per doz. 22 lbs. 15.50

IRONCLAD ADJUSTABLE GRASS CATCHERS

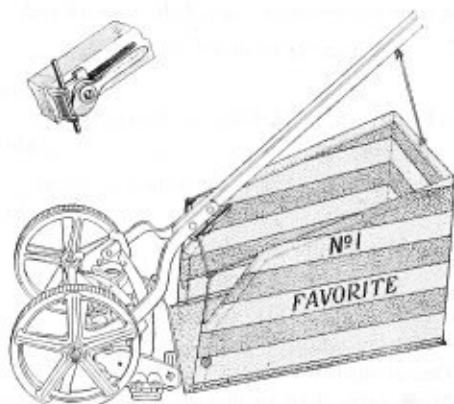


Made of heavy Striped Canvas, with Galvanized Iron Bottom. This combines lightness with durability, and is especially designed for the trade that wants the best irrespective of price.

PER DOZ.

- No. 1—For all high and low wheel mowers, 18 inches and smaller, weight per doz. 43 lbs.\$20.00
- No. 2—For all high and low wheel mowers, 18 to 24 inches, weight per doz. 50 lbs. 23.50

THE FAVORITE GRASS CATCHER

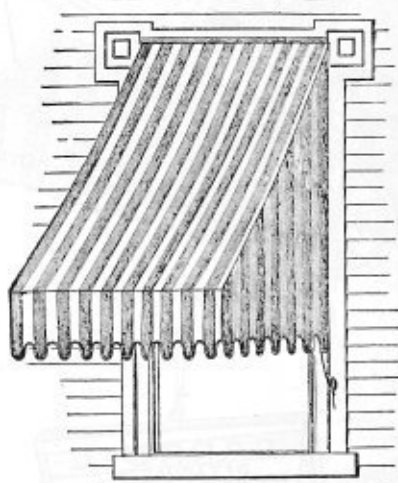


Made of heavy Striped Canvas on a steel frame, and with steel bottom. Large, strong and durable. Made for those who want the best.

- No. 1—Fits 12 to 16 inches inclusive, weight per doz. 36 lbs. Doz.\$13.50
- No. 2—Fits 16 to 20 inches inclusive, weight per doz. 47 lbs. Doz. 13.80

CARROLL ADJUSTABLE AWNINGS

Any awning will fit a window two inches wider or two inches narrower than the size it is made by spreading or contracting the arms where they fasten to the building, so that by making three sizes we can fit all ordinary windows.



Made in three sizes. Eight-ounce duplex duck, blue and white or brown and white, complete with pulleys, ropes, cleat, galvanized fixtures, screws, staples, etc., and full directions for hanging.

Height, 42 in.; projection, 30 in.

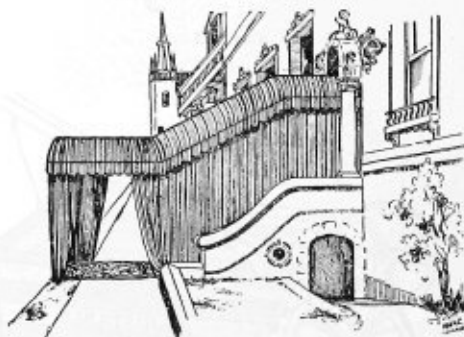
No. 1 fits windows 2 ft. 4 in., 2 ft. 6 in. and 2 ft. 8 in. wide.

No. 2 fits windows 2 ft. 10 in., 3 ft. and 3 ft. 2 in. wide.

No. 3 fits windows 3 ft. 4 in., 3 ft. 6 in. and 3 ft. 8 in. wide.

Price per dozen\$24.00

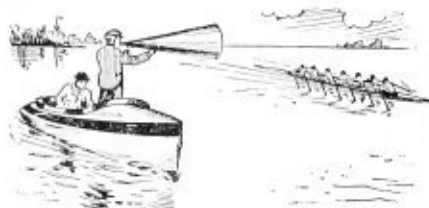
SIDEWALK CANOPIES



For weddings, receptions, etc. Prices on application.

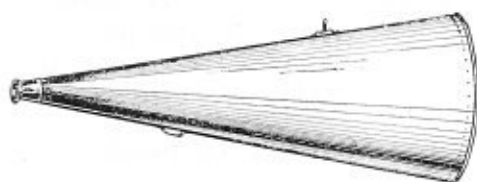


Megaphones



Made of stiff weather-proof and water-proof material. Words spoken through the Megaphone can be distinctly heard two miles away. Its utility in various ways will be very apparent

**Correct Design
Careful Workmanship**



**Right Material
Fine Finish**

PRICE LIST

No. 1.—12 in. Plain Strap Handle, Plain Mouth-piece, No Hoop, each.....	\$.25	No. 4.—24 in. Nickel Trimmings, with Hoop and Handle, each.....	\$2.25
No. 1A.—12 in. Nickeled Trimmings, with Hoop and Handle, each.....	1.00	No. 5.—30 in. Nickel Trimmings, with Hoop and Handle, each.....	2.50
No. 2.—15 in. Plain Strap Handle, Plain Mouth-piece, No Hoop, each.....	.40	No. 6.—36 in. Nickel Trimmings, with Hoop and Handle, each.....	3.00
No. 2A.—15 in. Nickeled Trimmings, with Hoop and Handle, each.....	1.50	No. 7.—42 in. Nickel Trimmings, with Hoop and Handle, each.....	3.50
No. 3.—20 in. Plain Strap Handle, Plain Mouth-piece, No Hoop, each.....	.50	No. 8.—48 in. Nickel Trimmings, with Hoop and Handle, each.....	5.00
No. 3A.—20 in. Nickeled Trimmings, with Handle and Hoop, each.....	1.75	No. 9.—60 in. Nickel Trimmings, with Hoop and Handle, each.....	8.00

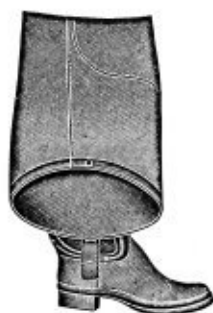


Few people are fully acquainted with the uses to which the megaphone is now put. The U. S. Navy, the large steamships and tug boats; all classes of yachts and sailing vessels, as well as many railroads, race tracks, golf clubs, etc., are using them in large numbers. The small megaphone or Hurrah Phone is a favorite among college and school boys for cheering on their men in athletic meets or foot ball and base ball games. They increase the volume of sound to such an extent that a small



body of students armed with them can drown the shouts from four times their number without.

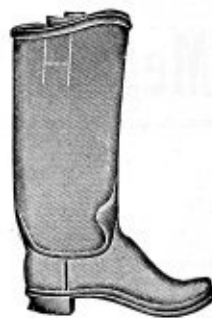
Rubber Boots



Hip Boots



Sporting Boots



Knee Boots



Knee Boots, leather soled

Men's Hip Boots

Heavy weight, dull finish. Fusion lined. An excellent boot, fully guaranteed. Widths, F to W.

Men's Duck.....	per pair, \$6.85
Men's Gum.....	" " 6.10

Men's Knee Boots

Wool or fusion lined. Dull finish. Widths, F to U.

Duck Camp, rolled edge	per pair, \$4.40
Heavy Common Knee.....	" " 4.20

Men's Sporting Boots

Light weight, dull finish. Wool net lined. The best boot on the market for general use.

Men's Duck.....	per pair, \$6.85
Men's Gum.....	" " 6.10

Parker's Leather-Soled Rubber Boots

Double sole-leather bottom.

Short, plain leather sole.....	per pair, \$6.00
Short, Hungarian nailed.....	" " 6.50
Hip Boot, Hungarian nailed	" " 8.10

Rubber Gloves—Not Lined

Short Gloves

Black or Tan



Men's Fine, sizes 10 to 12.....	per pair, \$1.50
Men's Heavy Driving, sizes 13 to 15....	" " 2.50
Men's White Heavy Acid, sizes 13 to 15, "	" " 3.50

Half Long and Long



Half Long Gloves

With Gauntlet 5 inches long.

Men's Fine, sizes 10 to 12.....	per pair, \$1.80
Men's Fine, Heavy Driving, sizes 13 to 15.....	" " 3.00
Men's Fine, Heavy Acid, sizes 13 to 15, "	" " 3.75

Long Rubber Gloves

With Gauntlet 9 inches long.

Men's Heavy, sizes 13 to 15.....	per pair, \$4.00
----------------------------------	------------------

Special Electrical Linemen's Gloves

Short, Extra High on Palms, sizes 13 to 15	per pair, \$3.00
Half Long, Extra High on Palms, sizes 13 to 15.....	" " 4.00

For a proper fit in heavy rubber Gloves allow two sizes larger than for kid Gloves.

Oiled Clothing



Pommel Slicker



Slicker

Frock or
Half CoatJacket and
Pants

Fish Brand: Made double throughout, in black and yellow. They cost more to make and are the most durable goods made. Every Fish brand garment warranted to give perfect satisfaction.

Shield Brand: Made double throughout, in black and yellow. For durability and water-proof qualities they are excelled by the Fish brand goods only.

Cape Ann Brand: Made double in yellow and black, to meet the demand for a cheap grade of double goods.

Style	Breast Measurements, inches	Length, inches	FISH BRAND		SHIELD BRAND		CAPE ANN BRAND	
			Yellow	Black	Yellow	Black	Yellow	Black
Slickers.....	50 to 56	57 to 62	\$30.00	\$31.25	\$25.00	\$26.25	\$21.00	\$22.25
Pommel Slickers...	50 to 56	54 to 60	35.00	36.25				
Motormen's Coats...	50 to 56	54 to 60		34.00		30.00		
Medium Long Coats	50 to 56	44	24.00	25.25	21.00	22.25	18.00	19.25
Frocks or Half Coats	48 to 54	38	21.00	22.25	18.00	19.00	15.50	16.75
Jackets.....	48 to 54	30 to 31	14.50	15.00	12.50	13.00	11.00	11.50
Apron Pants.....	42 to 48 waist	23 leg	14.50	15.00	12.50	13.00	11.00	11.50
Overalls with Apron	42 to 48 "	23 "	14.50	15.00	12.50	13.00	11.00	11.50
String Pants.....	42 to 48 "	23 "	14.00	14.50	12.00	12.50	10.50	11.00

Fish Brand Aprons

Style	Yellow, per Dozen	Black, per Dozen
Duck, Butchers'.....	\$10.00	\$10.00
Drill, Butchers'.....	9.00	9.00
Common Barvel.....	8.00	8.00

"Sou'westers" or Waterproof Hats



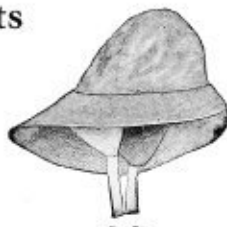
Fish Brand



Cape Ann



Squam

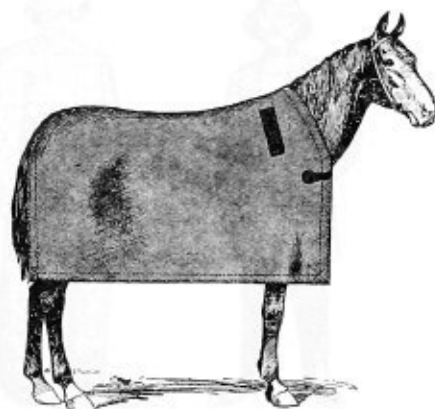


Soft

Kind of Hat	PRICE, EACH		Kind of Hat	PRICE, EACH	
	Yellow	Black		Yellow	Black
Fish Brand.....		\$0.50	Cape Ann.....	\$0.55	\$0.55
Soft.....	\$0.75	.75	Squam.....	.35	.35

STORM BLANKETS

Covered and Lined



No. 1129—A blizzard-proof Triplex Blanket made of strong grey mixture heavy water-proof duck with heavy wool lining interlined with rubber; all edges turned up and sewed all around. Hame leathers, trace carriers, and adjustable front straps included. Made in four sizes.

76 in. x 80 in.	each	\$4.90
80 " x 84 "	"	5.00
84 " x 90 "	"	5.50
90 " x 96 "	"	6.50

No. 1132—"Bernays." Square horse blankets. Made of heavy brown duck, lined with good striped blanket, edges turned back, hemmed all around, fitted with hame leathers, trace carriers and adjustable front strap. Size, 84" x 90".

Price, each.....\$5.20

No. 1133—"Salvator." Square horse blankets. Made of heavy brown duck, lined with best quality-fawn blanket, edges turned back and hemmed all around, fitted with hame leathers, trace carriers and adjustable front strap. Size, 84" x 90".

Price, each.....\$6.50

No. 1134—"Tenny." Square horse blankets. Water-proof, made of heavy brown gulls-wing duck, fully lined with dark heavy mixed lining, edges turned back and hemmed all around, finished with hame leathers, trace carriers and adjustable front strap. Size, 80" x 84".

Price, each.....\$6.00

No. 1135—The strongest and best storm blanket made. Covered with heavy gulls-wing, which prevents the water from getting through, lined with fawn colored wool blanket seven pounds in weight. Edges turned and hemmed all around. Fitted with hame leathers, trace carriers and adjustable front straps. Specially reinforced. Size 84" x 90".

Price, each.....\$8.00

STABLE BLANKETS

Covered and Lined



Made in three sizes:

No. 1, for horses weighing from 900 to 1,150 pounds

No. 2, for horses weighing from 1,200 to 1,450 pounds

No. 3, for horses weighing from 1,500 to 1,700 pounds

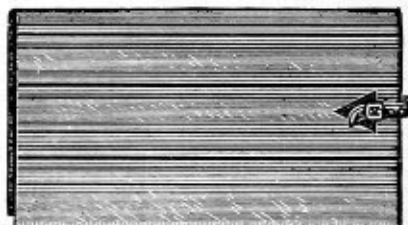
D 1120—"Brigadier" blanket made of 10-oz. satin finish Bur-lap, lined with good lining, edges turned up and hemmed all around, fitted with two 1½" web surcingle and stays, reinforced on top of neck and breast.

No. 1. Each...\$2.25 | No. 2. Each...\$2.50 | No. 3. Each...\$2.75

D 1121—"Survive," made of fancy blue and brown check, fully lined, with two 2" blue web surcingle and 2" web binding around entire blanket, two snaps in front.

No. 1. Each...\$3.25 | No. 2. Each...\$3.75 | No. 3. Each...\$4.25

WOOL BLANKETS



D 105—"Fairplay Blanket." Square horse blanket. Body of dark brown, with red and blue striped border. Good mixture wool filling. Sewed strap. Size, 76" x 80"; weight, 5 pounds.

Price, each.....\$2.00

D 106—"Hickory." Square horse blankets. Body of dark brown, with stripes of red, yellow and white; fancy border. Made of heavy warp and good mixed wool filling; sewed strap. A good blanket for the price. Size, 80" x 84"; weight, 5 pounds.

Price, each.....\$2.20

D 107—"Pequign." Square horse blankets. Fawn colored, with red stripes and fancy border. Made of extra heavy warp and good mix of wool filling; sewed strap. This is a very serviceable blanket and it is exceptionally cheap for the quality. Size, 84" x 90"; weight, 6 pounds. Price, each.....\$5.00

D 108—"Vincennes." Fawn colored square horse blankets. Plain fawn color body, with three rows of wide and four rows of narrow scarlet border stripes, double weave, close and firm, cotton warp, mixed wool stock filling, sewed strap. This is the best fawn blanket for the money now on the market. We are selling it as a leader. Size, 80" x 84"; weight, 6 pounds.

Price, each.....\$3.75

D 109—"Middlesex." Fawn colored square horse blankets. Close, firm and durable. Plain fawn colored body, with wide scarlet border, strong cotton warp, wool filling. Size, 84" x 90"; weight, 7 pounds. Price, each.....\$6.00

D 110—"All-wool, plain horse blanket. Best quality throughout; fancy plaids on red, green or orange ground; all wool, best quality and fast colors. Heavy weave, strong and durable. Size, 84" x 90"; weight, 7 pounds. Price, each.....\$9.00

D 111—"All-wool, green or black horse blankets. Strictly first quality throughout. Plain green or black body. Absolutely high quality and fast colors. These are the best all-wool blankets on the market. Size, 90" x 96". Price, each.....\$10.00

CAMP FURNITURE

Very substantially built and well finished. By far the best camp furniture made

CAMP BEDS



No. 1



4 IN. X 5 IN. X 3 FT. 2 IN. LONG

Size		Weight, Lbs.	Price Each	Mosquito Bar Frames Extra.
Open.	Folded.			
6' 6" x 2' 4" x 14"	3' x 4" x 5"	15	\$3.50	\$0.75

TABLE

With or Without Folding Shelf



No. 7

Size Top, Opened.	Size of Pack- age Folded.	Weight, Pounds.	Price Each	
			Without Shelf.	With Shelf.
2' 3" x 3' 2"	3' 2" x 5" x 7"	16	\$3.75	\$4.50

HOUSE COTS



No. 2

Size Open Folded	Weight Pounds.	Price Each.	Mosquito Bar Frames Extra Each	Pillows Extra, Each.
6' 2" x 2' 4" 6' x 3" x 3"	12	\$3.00	\$0.75	\$0.30

RECLINING CAMP CHAIR



No.	Covering of Seat.	Frame.	Price Per Doz
1	Fancy Striped Duck	Hardwood Finished in Oil	\$24.00
2	Fancy Carpet	Hardwood Painted	36.00

RUBBER BATH TUBS



No. 20

Frame of Tub.	Body of Tub.	Length Open Feet.	Width Open Inches	Depth Inches.	Size Folded.	Weight Pounds.	Price Each.
Hard- wood Fin- ished, Var- nished.	Heavy Duck, Rub- bered	5	27	16	5' x 5" x 5"	16	\$12.00

FOLDING CAMP CHAIR



No. 3

Size Folded.	Weight, Pounds.	Covering of Seat.	Frame.	Price per Doz.
3 ft. 6 in. x 3 in.x3 in.	4½	Heavy Striped Canvas.	Hard wood Stained.	\$20.00

FOLDING LAWN CHAIR

No. 4

Same as above except back is 6 inches higher.

Size Folded.	Weight, Pounds.	Covering of Seat.	Frame.	Price per Doz.
3 ft. 6 in. x 3 in.x3 in.	5	Heavy Striped Canvas.	Hardwood Stained.	\$25.00

FOLDING LAWN SETTEES



Length.	Construction of Body.	Construction of Seat.	Price per Doz.
No. 14 3 ft. 6 in.	Hardwood Painted Red.	Hardwood Finished in Oil.	\$24.00
No. 15 5 ft. 6 in.	"	"	36.00

FOLDING CAMP CHAIRS



No. 10

Covering of Seat.	Frame.	Price per Doz.
Carpet.....	Hardwood, Stained.	\$13.75

FOLDING CAMP STOOL

Same as above, without back and 10 oz. duck seat.

No.	Covering of Seat.	Frame.	Price per Dozen.
5	10 oz. Brown Duck.....	Hardwood, Turned.....	\$ 6.00
28	White Duck....	Hardwood, Turned.....	4.20
26	Carpet.....	Hardwood, Turned.....	10.00

FOLDING LAWN STOOL

Same as Folding Camp Chair, with back.

No.	Covering of Seat.	Frame.	Price per Dozen.
6	.....	Hardwood.....	\$ 9.00
27	White Duck....	Hardwood, Turned, Filled or Painted...	5.60
25	Carpet.....	Hardwood, Turned.....	12.00

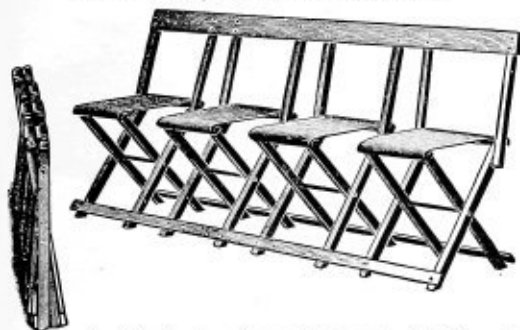
FOLDING CHAIRS

Made of Hard Maple, Var-nished.

No. 13. Price per doz., \$12.00



CHAUTAUQUA OR STOOL SETTEE



The best tent or outdoor settee ever devised. As the above illustration shows, a number of stools (usually four) are made up together to stand and fold as one piece. Our four stool settees are about 6 ft. long and 4 in. thick when folded, and weigh about 20 pounds. They are comfortable seats; made of air-dried rock elm, nicely finished. Made to order as desired.

No. 69. Price of 4-Stool Settee \$2.66

FOLDING PORCH CHAIR

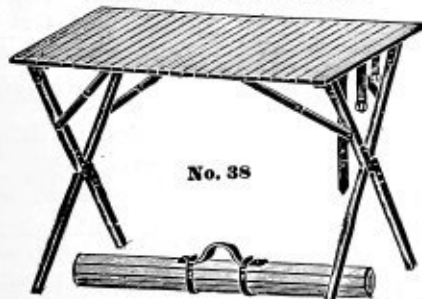
No. 35



This is the only chair made on this order that folds. It can be folded in two ways as illustrated. Very heavy drab duck seat and back.

Price each \$3.00

ROLL TOP CAMP TABLE



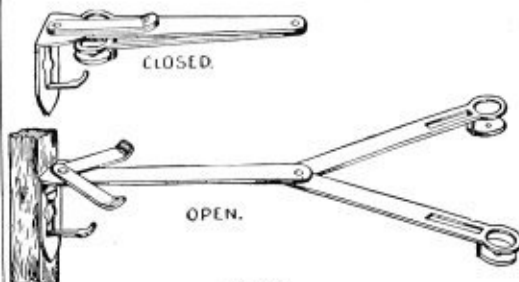
No. 38

This is a complete camp table, strong, light and convenient. Made in two sizes; 3 feet square and 27 inches by 3 feet. Folds into a small package about 6 inches in diameter. Weight 15 pounds.

Price size 36 inches by 27 inches.....each \$3.00

Price size 36 inches by 36 inches.....each \$3.33

CLOTHING AND CANDLE HOLDER

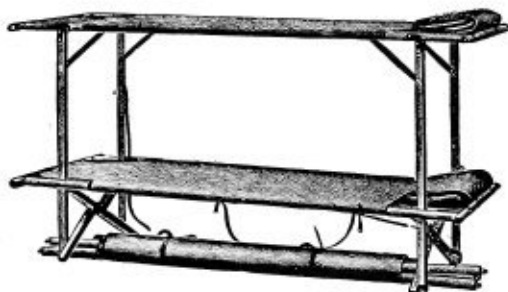


No. 66.

This is a very practical and convenient combination. It will hold a very large quantity of clothing or other articles, and two candles or a lantern. Made of 14 gauge steel to hang on a screw, two of which are furnished, and to fold into a remarkably small package about ten inches long. It cannot be bent or damaged, and is the most practical hanger ever offered.

Price Each, Complete, \$1.00

DOUBLE DECK COT



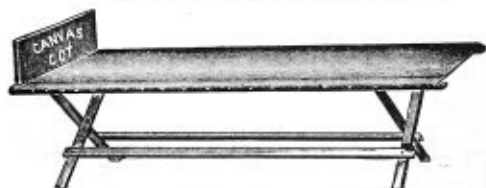
No. 65.

This is designed especially for portable houses or for tents, where space will not admit of two cots alongside. The combination is made up of one of our House Cots and another similar Cot about 28 inches above, thoroughly braced and attached to the lower Cot. When the lower Cot is occupied there is no danger of tipping, and the upper Cot, which is only about 40 inches above the floor, is perfectly rigid.

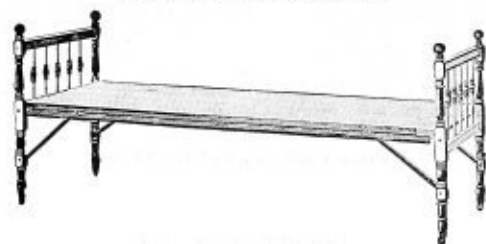
Each Cot is 6 ft. 6 inches long and 27 inches wide, covered with 12 oz. double filled brown duck and has a duck fold for a pillow. Both folded together are 6 ft. 4 inches long by about 8 inches in diameter and weigh about 25 pounds.

Price of Combination \$4.66

Woodwork all Air-Dried Rock Elm.

FOLDING CANVAS COTS

Width	Length	Covering	Price per Dozen
2 ft. 3 in.	6 ft. 2 in.	10-oz. White	\$15.00
2 " 3 "	6 " 2 "	12 " "	17.50
2 " 3 "	6 " 2 "	10 " Brown	17.50

FOLDING WIRE COTS

Width	Length	Price per Dozen
2 ft. 6 in.	6 ft.	\$39.00
3 "	6 "	40.00
3 " 6 in.	6 "	60.40

DUNNAGE BAGS

Besides the bags listed below we can make to order bags of any other size of any weight of duck for any purpose.



No.	Duck	Length, Inches	Net Price, Each
1	8 oz.	45	\$1.50
2	No. 8 (13-oz.)	45	2.00

SAILORS' BAGS

Navy pattern, heavy canvas with drawstring. Net each..... \$1.25
 Navy pattern, waterproofed canvas with drawstring. Net each..... 2.00
 All kinds of bags for clothing, provisions, etc., in any size, made to order on short notice.

SLEEPING BAGS

These bags are made of extra heavy close-woven tan or slate colored waterproof canvas, lined with sheepskin or wool and interlined with a bag of heavy drill. They are the warmest things, next fur, obtainable.

Style Lining	Weight, Each, Lbs.	Price Each
Wool.....	15	\$12.00
Sheep.....	20	24.00

**WATERPROOF CANVAS CLOTHING AND PROVISION BAGS**

Made of the best grade of brown waterproof canvas. Double top and edges doubly bound with braid, so as to insure good service. Made in several sizes.

Clothesbag

Diameter, Inches	Length, Inches	Weight, Ounces	Net Price
9	24	11	\$0.65
12	36	21	.85
15	36	29	1.00
18	36	35	1.25

Strong handles on side and bottom 25c. net extra per bag.

Lock for bag \$1.00 net.

EXTRA HEAVY CLOTHING AND PROVISION BAGS

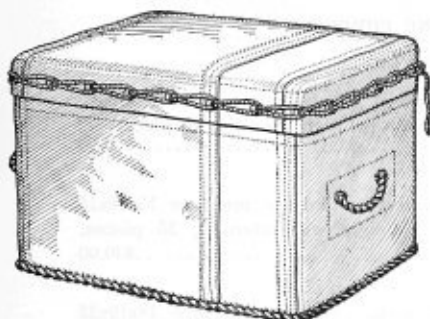
Same as above, only made heavier for very rough use.

Diameter, Inches	Length, Inches	Weight, Lbs.	Net Price
9	24	13½	\$0.90
12	36	23¼	1.30
15	36	4	1.60
18	36	43¼	2.00

Strong handles on side and bottom 35c. net extra per bag.

Lock for bag \$1.00 net.

LAUNDRY BAGS



Made of Heavy "O" Duck

The bottom edges of this bag are protected by a heavy rope. Seams are all double sewn. Handles of rope, securely fastened.

The bag that is built for service. Used by railroads and hotels.

Price each.....\$25.00

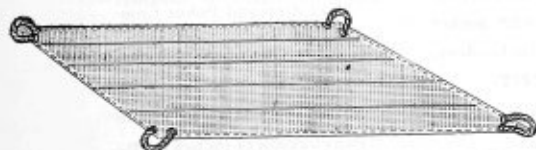
Can furnish other styles if desired, and make to order any special bag wanted.

CANVAS FIRE PAILS



Made of heavy canvas with rope bail and strap on bottom. Specially adapted for use in R. R. cars. No. 210. Capacity 10 qts. Per dozen.....\$12.00

PACK CLOTHS OR GROUND CLOTHS



Made of brown canvas. Just the thing for packing or as a covering or floor of your tent. Any size made.

Size, 5x6, each.....\$3.50

Size, 6x7, each.....4.50

Any size at 5½ cents per square foot.

POLISHING MITTENS

Made expressly for polishing purposes. The wearing surface of the mitten is made of sheepskin with the wool left on. A clean, modern article for polishing anything from a piano to a stove. Very serviceable.



Back of Mitt.



Front of Mitt.

Price, each.....\$0.75

CANVAS GLOVES AND MITTS

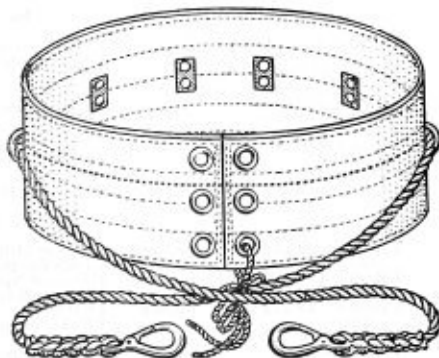


Per doz.

Canvas gloves.....\$1.50

Canvas mittens, lined.....2.25

WINDOW WASHER'S BELT



The strongest belt made. One that will give excellent service combined with perfect safety.

Price, each.....\$7.00

DONAVIN STOVES OR COOKING RANGES.

FOR CONTRACTORS AND CAMPING PURPOSES.

Everything Inside Ready for Use.



No. 4—Capacity 6 to 18 men. Outside measures 12x13x22 inches. Oven 8x12x12 inches. Weight with utensils, 26 pieces, 72 pounds. Price.....\$20.00

No. 3—Capacity 18 to 36 men. Outside measure 15x16x18 inches. Oven 9x15x16 inches. Weight with utensils, 35 pieces, 165 pounds. Price.....\$30.00

No. 2—Capacity 36 to 75 men. Outside measure 18x19x33 inches. Oven 11x18x20 inches. Weight with utensils, 35 pieces, 235 pounds. Price.....\$40.00

No. 1—Capacity 75 to 125 men. Outside measure 22x23x36 inches. Oven 14x21x23 inches. Weight with utensils, 38 pieces, 380 pounds. Price.....\$50.00

All the above are made of Malleable Iron and Steel, and are Really Unbreakable.

LIST OF UTENSILS INCLUDED IN THE ABOVE OUTFITS.

Sized to fit the range. Sized to nest and pack practically. Sized to contain and cook just the quantity of food needed.

No. 4 OUTFIT.

2 Boilers 11x7x5½ inches deep.
4 Joints Pipe.
1 Elbow.
1 Basting Spoon.
1 Locking Bar, Flue Cleaner,
Lid Lifter and Poker combined.

2 Pans 11½ x 11½ x 2¼ inches deep.
3 Dredges, Flour, Salt and Pepper.
1 Butcher Knife.
1 Cleaver

1 Paring Knife.
1 Pint Dipper.
2 Covers for Boilers.
1 Flesh Fork.
1 Shovel.
1 Pot Chain.

No. 3 OUTFIT.

1 Boiler 13½ x 7½ x 7¼ inches deep.
1 Boiler 13½ x 7½ x 7¼ inches deep.
3 Covers for Boilers.
4 Joints Pipe.
1 Elbow.
1 Shovel.
1 Pipe Guard.
1 Forged Spoon.

1 Steel.
3 Dredges, Flour, Salt and Pepper.
1 Flesh Fork.
1 Cake Turner.
1 Cleaver.
1 Pot Chain.
1 Pint Dipper.
1 Boiler 12½ x 6¼ x 6¼ inches deep.

2 Pans 15½ x 14½ x 3 inches deep.
1 Paring Knife.
1 Wire Broiler.
1 Coffee Strainer.
1 Skimmer.
1 Vegetable Masher.
1 Biscuit Cutter.
1 Locking Bar, Flue Cleaner,
Lid Lifter and Poker combined.

No. 2 OUTFIT.

1 Boiler 16½ x 10½ x 12 inches deep.
1 Boiler 16x10x12 inches deep.
1 Forged Spoon.
3 Covers for Boilers.
1 Elbow.
4 Joints Pipe.
1 Pipe Guard.
1 Shovel.
1 Dipper.
1 Cake Turner.

1 Coffee Mill.
1 Saw Knife.
1 Steel.
1 Skimmer.
1 Pot Chain.
1 Cleaver.
3 Dredges, Flour, Salt and Pepper.
1 Boiler 15½ x 9½ x 12 inches deep.
2 Pans 19x16½x3½ inches deep.

1 Large Fork.
1 Biscuit Cutter.
1 Vegetable Masher.
1 Wire Broiler.
1 Paring Knife.
1 Coffee Strainer.
1 Locking Bar, Flue Cleaner,
Lid Lifter and Poker Combined.

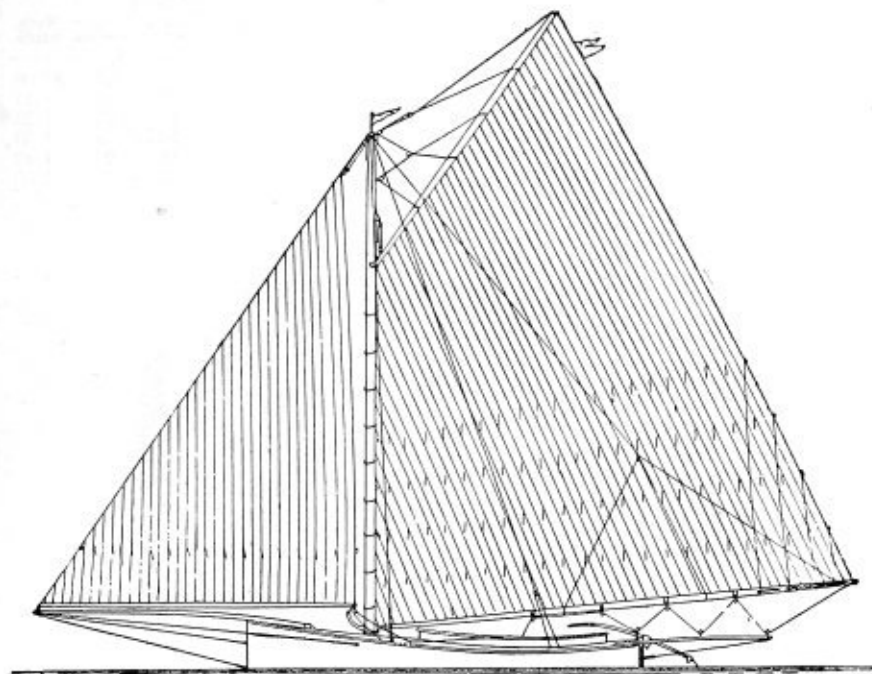
No. 1 OUTFIT.

1 Boiler 20 x 13½ x 12 inches deep.
1 Boiler 19½ x 12½ x 12 inches deep.
1 Boiler 19 x 12½ x 12 inches deep.
1 Saw Knife.
1 Wire Broiler.
1 Shovel.
1 Large Fork.
1 Vegetable Masher.

1 Coffee Mill.
4 Lids for Boilers.
1 Forged Spoon.
1 Paring Knife.
1 Cleaver.
1 Cake Turner.
1 Steel.
1 Pot Chain.
1 Dipper—2 qts.
1 Biscuit Cutter.
1 Pipe Guard.

1 Boiler 18½ x 11½ x 12 inches deep.
2 Pans 22x20½x4 inches deep.
3 Dredges, Flour, Salt and Pepper.
1 Elbow.
4 Joints Pipe.
1 Skimmer.
1 Coffee Strainer.
1 Locking Bar, Flue Cleaner,
Lid Lifter and Poker Combined.

YACHT SAILS



For Cat Boats, Sloops, Yawls, Schooners, Canoes or Ice Boats

INSTRUCTIONS FOR SAIL MEASURING

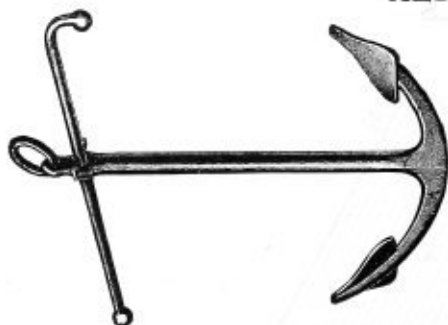
If your boat or yacht is already sparred send us the exact length of her masts, booms and gaffs, together with the following measurements:

- The distance from bowsprit end to mast.
- The distance from stem to mast.
- The distance from goose neck or saddle to throat halyard block
- The distance from saddle or goose neck to deck.
- The distance from throat to clew, called the "diagonal."
- The length of each jib stay.

We will send a sail plan upon request

We will guarantee every sail we send out to fit. Send your draft and we will submit samples and prices. We have many different qualities of sail cloth, made especially for yacht sails. They are all close and very suitable for the purpose intended. Sail covers made any size of white or brown waterproof canvas.

KEDGE ANCHORS



Size. Lbs.	Length Inches	Each. Black.	Each. Galvanized	Size. Lbs.	Length Inches	Each. Black.	Each. Galvanized
4	15½	\$0.58	\$0.70	10	24	\$1.08	\$1.42
5	16	.67	.83	12	27	1.17	1.53
6	18	.75	.95	14	27	1.25	1.63
7	21	.83	1.07	16	29	1.33	1.76
8	23	.93	1.20	18	29	1.42	1.88
9	23	1.00	1.30	20	31	1.50	2.00

DIRIGO FOLDING ANCHORS

Galvanized Iron



OPEN



CLOSED

Size. Lbs.	Length. Inches.	Price. Each.	Size. Lbs.	Length. Inches.	Price. Each.	Size. Lbs.	Length. Inches.	Price. Each.
4	17	\$1.25	10	23	\$2.50	20	30	\$4.50
6	19	1.50	12	25	3.00	26 up	33	20 Lb.
8	22	2.00	16	28	3.50			

STOCKLESS ANCHORS

Galvanized

BABBITT'S PATENT



No.	Weight. Lbs.	Price Each.	No.	Weight. Lbs.	Price Each.
0	7½	\$1.25	4	36	\$ 5.75
1	12	2.50	5	56	7.50
2	18	3.25	6	76	10.00
3	26	4.40	7	100	13.50

ROW LOCKS

Socket



Number.	Distance Between Horns. Inches.	Galv. Cast Iron. Price per Pair.	Galv. Mal. Iron. Price per Pair.	Polished Brass. Price per Pair.	Nickel Plated. Price per Pair.
0	1½	\$0.15	\$0.30	\$1.25	\$1.75
1	2	.20	.35	1.40	1.90
1½	2½	.25	.45	1.60	2.10
2	3	.30	.50	2.00	.....
2½	3½	.45	.60	2.60	.....
3	4	.65	.80	3.25	.....

Round Pocket



Number.	Diameter of Ring in the Clear. Inches.	Galvanized Cast Iron. Price per Pair.	Galv. Mal. Iron. Price per Pair.	Polished Brass. Price per Pair.
0.....	2	\$0.20	\$0.35	\$1.40
1.....	2½	.25	.40	1.50

Patent Swivel



Number.	Distance Between Horns. Inches.	Galvanized Malleable Iron. Price per Pair.	Polished Brass. Price per Pair.	Nickel Plated. Price per Pair.
0.....	1½	\$0.70	\$2.25	\$2.75
1.....	2	.85	2.40	2.90
2.....	2½	1.00	3.25	3.75
3.....	3	1.25	3.50	.....
4.....	3½	1.50	3.75	.....
5.....	4	1.75	4.00	.....

Side Plate



Number.	Distance Between Horns. Inches.	Galv. Cast Iron. Price per Pair.	Galv. Mal. Iron. Price per Pair.	Polished Brass. Price per Pair.
0.....	1½	\$0.20	\$0.35	\$1.30
1.....	2	.25	.40	1.50
2.....	2½	.35	.50	2.00

North River



Distance Between Horns. Inches.	Galvanized Cast Iron. Price per Pair.	Galvanized Malleable Iron. Price per Pair.
2	\$0.25	\$0.40

OARS.



SELECTED WHITE ASH.

Length, Feet.	Plain, Price Per Foot.	Copper Tipped, Price Per Foot.	Extra for Leathering, Price Per Pair.
6 to 12	\$0.16	\$0.17	\$1.00
13 to 16	.20	.21	1.00

Longer oars on application.

SPRUCE.

Length, Feet.	Plain, Price Per Foot.	Copper Tipped, Price Per Foot.	Extra for Leathering, Price Per Pair.
6 to 10	\$0.20	\$0.21	\$1.00

Extra for Varnishing, 25c.

SPRUCE SPOON SCULLS.

These Sculls are made of Selected White Spruce, Leathered, Varnished and Copper Tipped.

Length, Feet.	Price Per Pair.	Length, Feet.	Price Per Pair.
6, 6½ and 7	\$5.60	8½ and 9	\$7.20
7½ and 8	6.40	9¼ and 10	8.00

SPRUCE RACING SCULLS.

Made of the finest Spruce obtainable and each pair matched in weight.

Length, Feet.	Width of Blade, Inches.	Buttoned, Inches from End of Handle.	Price Per Pair.
9½	Scant 7	32	\$10.00

SINGLE PADDLES. Straight Blades.

All hand made of either Ash, Maple or Spruce; varnished and copper tipped where tips are necessary; Maple paddles not tipped, better without. Price, each, \$2.50.

DOUBLE JOINTED SPRUCE PADDLES. Straight Blades.

All hand made, copper tipped, varnished and jointed.

Spruce, spoon blade. Each\$8.00 | Spruce, straight blade. Each.....\$7.00

PUSH PADDLES.

Ash and Spruce. Copper Tipped.

Length, feet, 9. Price, each \$2.70
 " " 10. " " 3.00

TENT POLES. (Ironed.)

Length, Feet.	Diameter, Inches.	Price Per Hundred.	Length, Feet.	Diameter, Inches.	Price Per Hundred.
6	1¼		8	1¼	
7	1¼		10	1¼	
7½	1¼		10	2	

TENT KEYS AND RIDGES.

Prices on application.

COTTON DUCK LIST

All widths and weights. In rolls of about 100 yards each. Usually called roll duck or wide duck.

Prices are subject to change without notice.

We are prepared to quote price for goods, 4 to 208 inches wide.

Special prices on application. Widths not specified, based on next wider width.

List December 10, 1906

WIDE COTTON DUCK

Width Inches	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Width Inches	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard	Price Per Yard
No. 0	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14
26	\$0.52	\$0.50	\$0.47	\$0.44	\$0.41	\$0.39	\$0.36	26	\$0.35	\$0.33	\$0.31	\$0.29	\$0.26	\$0.24
28	.56	.53	.51	.48	.45	.42	.39	28	.38	.35	.33	.31	.28	.26
30	.60	.57	.54	.51	.48	.45	.41	30	.40	.38	.36	.33	.30	.28
32	.64	.61	.58	.54	.51	.48	.44	32	.43	.40	.39	.36	.32	.30
34	.68	.65	.61	.58	.54	.51	.47	34	.46	.43	.41	.38	.34	.32
36	.72	.69	.65	.61	.57	.53	.50	36	.48	.45	.43	.40	.36	.33
38	.76	.72	.68	.64	.60	.56	.52	38	.51	.48	.46	.42	.38	.35
40	.80	.76	.72	.68	.64	.59	.55	40	.54	.50	.48	.44	.40	.37
42	.84	.80	.76	.71	.67	.62	.58	42	.56	.53	.51	.47	.42	.39
44	.88	.84	.79	.74	.70	.65	.61	44	.59	.55	.53	.49	.44	.41
46	.92	.88	.83	.78	.73	.68	.63	46	.62	.58	.55	.51	.46	.43
48	.96	.91	.86	.81	.76	.71	.66	48	.64	.60	.58	.53	.48	.44
50	1.00	.95	.90	.85	.79	.74	.69	50	.67	.63	.60	.55	.50	.46
52	1.04	.99	.93	.88	.82	.77	.72	52	.70	.65	.63	.58	.52	.48
54	1.08	1.03	.97	.91	.86	.80	.74	54	.72	.68	.65	.60	.54	.50
56	1.12	1.06	1.01	.95	.89	.83	.77	56	.75	.70	.67	.62	.56	.52
58	1.16	1.10	1.04	.98	.92	.86	.80	58	.78	.73	.70	.64	.58	.54
60	1.24	1.17	1.11	1.04	.98	.91	.85	60	.82	.77	.74	.68	.62	.56
62	1.28	1.21	1.14	1.08	1.01	.94	.87	62	.85	.80	.76	.70	.64	.58
64	1.32	1.25	1.18	1.11	1.04	.97	.90	64	.88	.82	.79	.72	.66	.60
66	1.36	1.29	1.22	1.14	1.07	1.00	.93	66	.90	.85	.81	.75	.68	.62
68	1.40	1.33	1.25	1.18	1.11	1.03	.96	68	.93	.88	.84	.77	.70	.64
70	1.44	1.37	1.29	1.21	1.14	1.06	.99	70	.96	.90	.86	.79	.72	.66
72	1.52	1.44	1.36	1.28	1.20	1.12	1.04	72	1.01	.95	.90	.83	.76	.69
74	1.56	1.48	1.40	1.32	1.23	1.15	1.07	74	1.04	.98	.93	.86	.78	.71
76	1.60	1.52	1.44	1.35	1.27	1.18	1.10	76	1.07	1.00	.95	.88	.80	.73
78	1.65	1.56	1.47	1.39	1.30	1.22	1.13	78	1.10	1.03	.98	.90	.82	.75
80	1.69	1.60	1.51	1.42	1.33	1.25	1.16	80	1.12	1.05	1.00	.93	.84	.77
82	1.73	1.64	1.55	1.46	1.37	1.28	1.19	82	1.15	1.08	1.03	.95	.86	.79
84	1.86	1.77	1.67	1.57	1.47	1.37	1.28	84	1.24	1.16	1.10	1.01	.92	.84
86	2.00	1.90	1.79	1.69	1.58	1.48	1.37	86	1.32	1.23	1.18	1.08	.98	.89
88	2.05	1.94	1.83	1.72	1.62	1.51	1.40	88	1.35	1.27	1.20	1.11	1.00	.92
90	2.09	1.98	1.87	1.76	1.65	1.54	1.43	90	1.39	1.30	1.23	1.13	1.03	.94
92	2.14	2.03	1.92	1.80	1.69	1.58	1.47	92	1.42	1.33	1.26	1.16	1.05	.96
94	2.34	2.22	2.09	1.97	1.85	1.72	1.60	94	1.54	1.44	1.37	1.25	1.14	1.03
96	2.38	2.26	2.14	2.01	1.89	1.76	1.64	96	1.58	1.47	1.40	1.28	1.16	1.05
98	2.49	2.36	2.23	2.10	1.97	1.84	1.71	98	1.64	1.54	1.45	1.33	1.21	1.10
100	2.54	2.41	2.27	2.14	2.01	1.87	1.74	100	1.68	1.57	1.48	1.36	1.23	1.12
102	2.59	2.46	2.32	2.18	2.05	1.91	1.78	102	1.71	1.60	1.51	1.39	1.26	1.14
104	2.64	2.50	2.37	2.23	2.09	1.95	1.81	104	1.74	1.63	1.54	1.41	1.28	1.16
106	2.69	2.55	2.41	2.27	2.13	1.99	1.84	106	1.78	1.66	1.57	1.44	1.31	1.19
108	2.74	2.60	2.46	2.31	2.17	2.02	1.88	108	1.81	1.69	1.60	1.47	1.33	1.21
110	2.80	2.65	2.50	2.35	2.21	2.06	1.91	110	1.87	1.72	1.63	1.50	1.35	1.23
112	2.85	2.70	2.55	2.40	2.25	2.10	1.95	112	1.88	1.76	1.66	1.52	1.38	1.25
114	2.90	2.75	2.59	2.44	2.29	2.14	1.98	114	1.91	1.79	1.69	1.55	1.40	1.28
120	3.05	2.89	2.73	2.57	2.41	2.25	2.09	120	2.01	1.88	1.78	1.63	1.48	1.34
128	3.39	3.21	3.03	2.86	2.68	2.50	2.32	128	2.23	2.09	1.97	1.82	1.63	1.48
132	3.71	3.51	3.32	3.12	2.93	2.73	2.54	132	2.43	2.27	2.14	1.96	1.77	1.61
136	4.78	4.53	4.27	4.02	3.77	3.52	3.27	136	3.16	2.94	2.75	2.51	2.29	2.09
144	5.13	4.86	4.59	4.32	4.05	3.79	3.51	144	3.39	3.15	2.95	2.69	2.46	2.24

UNITED STATES ARMY DUCK

7-oz., 28½-in....	\$0 16	10-oz., 28½-in....	\$0 23
8-oz., 28½-in....	.18	12-oz., 28½-in....	.27
9-oz., 28½-in....	.20	15-oz., 28½-in....	.33

WOODBURY YACHT

8-oz., 28½-in....	\$0 19	10-oz., 28½-in....	\$0 24
9-oz., 28½-in....	.21	12-oz., 28½-in....	.29
		15-oz., 28½-in....	\$0 35

COTTON SAIL DUCK

(Hard, medium and soft.) All the brands.

No.	22-inch	24-inch
00	\$0.45	\$0.49
0	.43	.47
1	.40	.44
2	.38	.42
3	.36	.39
4	.35	.38
5	.33	.36
6	.32	.35
7	.31	.33
8	.29	.32
9	.28	.30
10	.26	.28
11	.25	.27
12	.24	.26

HEAVY NAUGHT DUCK

No.	22-inch	24-inch
3-0	\$0.47	\$0.51
4-0	.49	.53
5-0	.51	.55
6-0	.53	.57
7-0	.56	.60
8-0	.57	.61
9-0	.60	.64
10-0	.62	.66
12-0	.67	.72

NARROW DUCK

(Over 12-in.)

No.	14-inch	16-inch	18-inch	20-inch
00	\$0.28	\$0.31	\$0.35	\$0.38
0	.27	.30	.34	.37
1	.26	.29	.33	.35
2	.25	.28	.31	.33
3	.24	.26	.29	.31
4	.23	.25	.28	.30
5	.22	.24	.27	.29
6	.21	.23	.26	.28
7	.20	.22	.25	.27
8	.18	.20	.24	.26
9	.17	.19	.23	.25
10	.16	.18	.21	.23
11	.15	.17	.20	.22
12	.14	.16	.19	.21

HEAVY NARROW DUCK

(Over 12-in.)

No.	14-inch	16-inch	18-inch	20-inch
3-0	\$0.33	\$0.36	\$0.39	\$0.43
4-0	.35	.38	.41	.45
5-0	.37	.40	.43	.47
6-0	.39	.42	.45	.49
8-0	.43	.46	.49	.53
10-0	.47	.50	.54	.58
12-0	.52	.55	.59	.63

Cash prices subject to trade discount.

OUNCE GOODS

OAKWOODS AND MONARCH

Double Filling

In bolts of about 50 yards each. In bales of 500 to 1,000 yards each.

7 oz., 29 inches wide	\$.....per yard.
8 " 29 " "	"
10 " 29 " "	"
12 " 29 " "	"
15 " 29 " "	"

FALCON AND MAGNOLIA DUCK

Single Filling

In bolts of about 50 yards each. In bales of 500 to 1,000 yards each.

7 oz., 29 inches wide	\$.....per yard.
8 " 29 " "	"
9 " 29 " "	"
10 " 29 " "	"
12 " 29 " "	"

ENAMELING DUCK

38 to 72 inches wide.

DRILL

30 to 37 inches wide. All Weights.

BLEACHED DUCK

All Weights.

TRUNK DUCK

All Colors.

DYED DUCK

For Overalls, Hunting Suits, Leggings, Trunks, Etc.

Mode, Brown, Sage Green, Bleached, Tan, Drab, Black.

6 oz. 6½ oz. 7 oz. 8 oz. 9 oz. 10 oz. 12 oz. 15 oz.

ENAMEL DUCK, ETC.

Pebble Leather and Long Grain

List July 1, 1907.

4-4 Black Enameled Drill	\$0.29
5-4 " " "	30
50 in. " " "	32
6-4 " " "	37
3-8 in. " " Duck	36
5-4 " " "	38
50 in. " " "	40
6-4 " " "	44
60 in. " " "	59
5-4 Tan Back Drill	39
48 in. " " "	41
5-4 Imitation Gum Drill	30
50 in. " " "	32
50 in. Leather Cloth	85
6-4 in. " " "	91
60 in. " " "	97

ACHILLES WATERPROOF CLOTH

We import this from Belgium. It is made of flax and so treated that it is absolutely waterproof, yet soft and easy to handle. We carry it in two weights of the dark brown. It is about as heavy as No. 4 White Cotton Duck.

Width, In.	Weight	Color	Price per Yard
40 $\frac{1}{2}$	Light	Brown	\$1.25
40 $\frac{1}{2}$	Regular	Brown	1.50

GULL'S WING WATERPROOF CLOTH

Our Gull's Wing Waterproof Cloth is made of army duck and chemically prepared. It is absolutely waterproof.

Description	Number of Yards in Piece	Price Per Yard
28 inch, 10 ounce, white	50	\$0.35
28 " 12 " "	50	.40
28 " 15 " "	50	.45
28 " 10 " tan	50	.40
28 " 12 " "	50	.45
28 " 15 " "	50	.50

BLACK OILED DUCK FOR WAGON TOPS, ETC.

Phoenix Brand

Put up in rolls of about 25 yards.

Widths, Inches	No. 10, per Yard	No. 12, per Yard
36	\$0.79	\$0.66
40	.88	.74
44	.97	.80
50	1.10	.91
54	1.19	.99
60	1.32	1.10
66	1.45	1.21
72	1.73	1.44
84	2.02	1.68

HEAVY NAUGHT OR PAPER DUCK

List Dec. 11, 1905

Price per Yard

Subject to trade discount.

Nos.	2/0	3/0	4/0	5/0	6/0	7/0	8/0	
Width	26 in.	\$0.52	\$0.55	\$0.57	\$0.60	\$0.63	\$0.65	\$0.68
"	30 in.	.60	.63	.66	.69	.72	.75	.78
"	34 in.	.68	.71	.75	.78	.82	.85	.88
"	36 in.	.72	.76	.79	.83	.86	.90	.94
"	38 in.	.76	.80	.84	.88	.91	.95	.99
"	40 in.	.80	.84	.88	.92	.96	1.00	1.04
"	42 in.	.84	.88	.93	.97	1.01	1.05	1.09
"	44 in.	.88	.92	.97	1.01	1.05	1.10	1.14
"	46 in.	.92	.97	1.01	1.06	1.10	1.15	1.20
"	48 in.	.96	1.01	1.05	1.10	1.15	1.20	1.25
"	50 in.	1.00	1.05	1.10	1.15	1.20	1.25	1.30
"	52 in.	1.04	1.09	1.15	1.20	1.25	1.30	1.35
"	54 in.	1.08	1.13	1.19	1.24	1.29	1.35	1.40
"	56 in.	1.12	1.17	1.23	1.29	1.34	1.40	1.45
"	58 in.	1.16	1.22	1.28	1.34	1.39	1.45	1.51
"	60 in.	1.20	1.26	1.32	1.38	1.44	1.50	1.56
"	62 in.	1.24	1.30	1.36	1.42	1.48	1.55	1.61
"	64 in.	1.28	1.34	1.40	1.47	1.53	1.60	1.66
"	66 in.	1.32	1.38	1.45	1.51	1.58	1.65	1.71
"	68 in.	1.36	1.42	1.49	1.56	1.63	1.70	1.76
"	70 in.	1.40	1.47	1.54	1.61	1.68	1.74	1.81
"	72 in.	1.44	1.51	1.57	1.65	1.72	1.79	1.87
"	74 in.	1.48	1.55	1.62	1.70	1.77	1.84	1.92
"	76 in.	1.52	1.59	1.67	1.74	1.82	1.89	1.97
"	78 in.	1.56	1.63	1.71	1.79	1.87	1.94	2.02
"	80 in.	1.60	1.68	1.75	1.83	1.91	1.99	2.07
"	82 in.	1.64	1.72	1.80	1.88	1.96	2.04	2.12
"	84 in.	1.68	1.76	1.84	1.93	2.01	2.09	2.18
"	86 in.	1.72	1.80	1.89	1.97	2.06	2.14	2.23
"	88 in.	1.76	1.84	1.93	2.02	2.10	2.19	2.28
"	90 in.	1.79	1.88	1.97	2.06	2.15	2.24	2.33
"	92 in.	1.83	1.93	2.02	2.11	2.20	2.29	2.38
"	94 in.	1.87	1.97	2.06	2.15	2.25	2.34	2.44
"	96 in.	1.91	2.01	2.10	2.20	2.30	2.39	2.49
"	98 in.	1.95	2.05	2.15	2.25	2.34	2.44	2.54
"	100 in.	1.99	2.09	2.19	2.29	2.39	2.49	2.59
"	102 in.	2.03	2.13	2.23	2.34	2.44	2.54	2.64
"	104 in.	2.07	2.18	2.28	2.38	2.49	2.59	2.69
"	106 in.	2.11	2.22	2.32	2.43	2.53	2.64	2.75
"	108 in.	2.15	2.26	2.37	2.47	2.58	2.69	2.80
"	110 in.	2.19	2.30	2.41	2.52	2.63	2.74	2.85
"	112 in.	2.23	2.34	2.45	2.57	2.68	2.79	2.90
"	114 in.	2.27	2.39	2.49	2.61	2.73	2.84	2.95
"	116 in.	2.31	2.43	2.54	2.66	2.77	2.89	3.00
"	118 in.	2.35	2.47	2.59	2.70	2.82	2.94	3.06
"	120 in.	2.39	2.51	2.63	2.75	2.87	2.99	3.11
"	122 in.	2.57	2.70	2.83	2.95	3.08	3.21	3.34
"	124 in.	2.61	2.74	2.87	3.00	3.13	3.26	3.39
"	126 in.	2.66	2.79	2.92	3.05	3.18	3.32	3.45
"	128 in.	2.70	2.83	2.96	3.10	3.23	3.37	3.50
"	130 in.	2.74	2.88	3.01	3.15	3.28	3.42	3.56
"	132 in.	2.78	2.92	3.06	3.20	3.33	3.47	3.61
"	133 in.	2.94	3.10	3.25	3.39	3.54	3.69	3.84
"	134 in.	2.96	3.12	3.27	3.42	3.57	3.72	3.87
"	136 in.	3.01	3.17	3.32	3.47	3.62	3.77	3.92
"	138 in.	3.06	3.22	3.37	3.52	3.68	3.83	3.98
"	140 in.	3.11	3.27	3.42	3.57	3.73	3.87	4.04
"	142 in.	3.16	3.32	3.47	3.62	3.79	3.94	4.10

OLD SAIL CLOTH

We carry always a large stock from which we can cut covers of any size, or canvas wheels for buffing.

USEFUL INFORMATION

STEAM

A cubic inch of water evaporated under atmospheric pressure is approximately converted into 1 cubic foot of steam.

The horse-power of boilers, as per standard adopted by the Am. S. M. E., is 30 pounds water evaporated per hour at a pressure of 70 pounds per square inch and from a temperature of 100 degrees Fahr.

Well designed boilers, under successful operation, will evaporate from 7 to 10 pounds of water per pound of first-class coal.

Each square foot of heating surface is considered sufficient to evaporate 2 pounds of water; therefore, for an engine using 30 pounds of water per horse-power per hour, each horse-power of the engine requires 15 square feet heating surface in the boiler.

On one square foot of fire grate can be burned on an average from 10 to 12 pounds hard coal, or 18 to 20 pounds soft coal, per hour, with natural draft.

Two and one-quarter pounds of dry wood is equal to 1 pound of average quality soft coal.

Steam engines consume from 12 to 50 pounds of feed water, and from $1\frac{1}{4}$ to 7 pounds of coal, per hour per indicated horse-power.

Condensing engines require from 20 to 30 times the amount of feed water for condensing purposes; approximately for most engines, 1 to $1\frac{1}{2}$ gallons condensing water per minute per indicated horse-power.

WATER

One cubic inch weighs .0361 pounds.

One pound = 27.7 cubic inches.

One cubic foot = 62.4245 pounds at 39 degrees Fahr.; 7.48 gallons U. S.; 6.2321 gallons imperial.

One gallon U. S. = 8.33111 pounds; 231 cubic inches; .13368 cubic feet.

One imperial gallon = 10 pounds at 62 degrees Fahr.; 277.274 cubic inches; .16046 cubic feet.

One pound pressure = 2.31 feet in height.

One foot in height = .433 pounds pressure.

Petroleum weighs $6\frac{1}{2}$ pounds per U. S. gallon, 42 gallons to the barrel.

To convert imperial gallons into U. S. gallons, multiply by the factor 1.2. To convert U. S. gallons into imperial gallons, multiply by the factor .8333.

A *miner's inch* is a measure for flow of water, and is the quantity of water that will flow in one minute through an opening 1 inch square in a plank 2 inches thick under a head of $6\frac{1}{2}$ inches to the centre of the orifice. This is equivalent, approximately, to 1.53 cubic feet, or $11\frac{1}{2}$ gallons per minute.

To find the diameter of pump plungers to pump a given quantity of water at 100 feet piston speed per minute, divide the number of gallons by 4, then extract the square root, and the result will be the diameter in inches of the plungers.

To find the number of gallons delivered per minute by a single double-acting pump at 100 feet piston speed per minute, square the diameters of the plungers, then multiply by 4.

To find the horse-power necessary to elevate water to a given height, multiply the weight of the water elevated per minute by the height in feet and divide the product by 33,000 (an allowance should be made for water friction and a further allowance for losses in the steam cylinder, say from 20 to 30 per cent.).

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches, or a column of water 33.9 feet high at sea level.

To determine the proportion between the steam and pump cylinder, multiply the given area of the pump cylinder by the resistance on the pump in pounds per square inch, and divide the product by the available pressure of steam in pounds per square inch. The product equals the area of the steam cylinder. To this must be added an extra area to overcome the friction, which is usually taken at 25 per cent.

The resistance of friction in the flow of water through pipes of uniform diameter is independent of the pressure and increases directly as the length and the square of the velocity of the flow, and inversely as the diameter of the pipe. With wooden pipes the friction is 1.75 times greater than in-metallic. Doubling the diameter increases the capacity four times.

To determine the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144 and divide the product by the area of the pipe in inches.

To determine the area of a required pipe, the volume and velocity of water being given, multiply the number of cubic feet of water by 144 and divide the product by the velocity in feet per minute.

PRESSURE OF WATER

The pressure of water in pounds per square inch for every foot in height to 260 feet: and then, by intervals, to 3,000 feet head. By this table, from the pounds pressure per square inch, the feet head is readily obtained, and *vice versa*.

Feet Head	Pressure per Square Inch	Feet Head	Pressure per Square Inch	Feet Head	Pressure per Square Inch	Feet Head	Pressure per Square Inch	Feet Head	Pressure per Square Inch	Feet Head	Pressure per Square Inch
1	0.43	54	23.39	107	46.34	160	69.31	213	92.20	265	123.45
2	0.86	55	23.82	108	46.78	161	69.74	214	92.63	290	125.62
3	1.30	56	24.26	109	47.21	162	70.17	215	93.13	295	127.78
4	1.73	57	24.69	110	47.64	163	70.61	216	93.56	300	129.95
5	2.16	58	25.12	111	48.08	164	71.04	217	93.99	305	132.12
6	2.59	59	25.55	112	48.51	165	71.47	218	94.43	310	134.28
7	3.03	60	25.99	113	48.94	166	71.91	219	94.86	315	136.46
8	3.46	61	26.42	114	49.38	167	72.34	220	95.30	320	138.62
9	3.89	62	26.85	115	49.81	168	72.77	221	95.73	325	140.79
10	4.33	63	27.29	116	50.24	169	73.20	222	96.16	330	142.95
11	4.76	64	27.72	117	50.68	170	73.64	223	96.60	335	145.12
12	5.20	65	28.15	118	51.11	171	74.07	224	97.03	340	147.28
13	5.63	66	28.58	119	51.54	172	74.50	225	97.46	345	149.45
14	6.06	67	29.02	120	51.98	173	74.94	226	97.90	350	151.61
15	6.49	68	29.45	121	52.41	174	75.37	227	98.33	355	153.78
16	6.93	69	29.88	122	52.84	175	75.80	228	98.76	360	155.94
17	7.36	70	30.32	123	53.28	176	76.23	229	99.20	365	158.10
18	7.79	71	30.75	124	53.71	177	76.67	230	99.63	370	160.27
19	8.22	72	31.18	125	54.15	178	77.10	231	100.0	375	162.45
20	8.66	73	31.62	126	54.58	179	77.53	232	100.49	380	164.61
21	9.09	74	32.05	127	55.01	180	77.97	233	100.93	385	166.78
22	9.53	75	32.48	128	55.44	181	78.40	234	101.36	390	168.94
23	9.96	76	32.92	129	55.88	182	78.84	235	101.79	395	171.11
24	10.39	77	33.35	130	56.31	183	79.27	236	102.23	400	173.27
25	10.82	78	33.78	131	56.74	184	79.70	237	102.66	425	184.10
26	11.26	79	34.21	132	57.18	185	80.14	238	103.09	450	195.0
27	11.69	80	34.65	133	57.61	186	80.57	239	103.53	475	205.77
28	12.12	81	35.08	134	58.04	187	81.0	240	103.96	500	216.58
29	12.55	82	35.52	135	58.48	188	81.43	241	104.39	525	227.42
30	12.99	83	35.95	136	58.91	189	81.87	242	104.83	550	238.25
31	13.42	84	36.39	137	59.34	190	82.30	243	105.26	575	249.09
32	13.86	85	36.82	138	59.77	191	82.73	244	105.69	600	259.90
33	14.29	86	37.25	139	60.21	192	83.17	245	106.13	625	270.73
34	14.72	87	37.68	140	60.64	193	83.60	246	106.56	650	281.56
35	15.16	88	38.12	141	61.07	194	84.03	247	106.99	675	292.40
36	15.59	89	38.55	142	61.51	195	84.47	248	107.43	700	303.22
37	16.02	90	38.98	143	61.94	196	84.90	249	107.86	725	314.05
38	16.45	91	39.42	144	62.37	197	85.33	250	108.29	750	324.88
39	16.89	92	39.85	145	62.81	198	85.76	251	108.73	775	335.72
40	17.32	93	40.28	146	63.24	199	86.20	252	109.16	800	346.54
41	17.75	94	40.72	147	63.67	200	86.63	253	109.59	825	357.37
42	18.19	95	41.15	148	64.10	201	87.07	254	110.03	850	368.20
43	18.62	96	41.58	149	64.54	202	87.50	255	110.46	875	379.03
44	19.05	97	42.01	150	64.97	203	87.93	256	110.89	900	389.86
45	19.49	98	42.45	151	65.40	204	88.36	257	111.32	925	400.70
46	19.92	99	42.88	152	65.84	205	88.80	258	111.76	950	411.54
47	20.35	100	43.31	153	66.27	206	89.21	259	112.19	975	422.35
48	20.79	101	43.75	154	66.70	207	89.66	260	112.62	1000	433.18
49	21.22	102	44.18	155	67.14	208	90.10	261	113.06	1500	649.7
50	21.65	103	44.61	156	67.57	209	90.53	262	113.49	2000	866.3
51	22.09	104	45.05	157	68.0	210	90.96	270	116.96	3000	1,299.5
52	22.52	105	45.48	158	68.43	211	91.39	275	119.12	.....	.....
53	22.95	106	45.91	159	68.87	212	91.83	280	121.29	.....	.....

H.Channon Company. Chicago.

HEIGHTS IN FEET TO WHICH PUMPS WILL ELEVATE WATER

Steam pressure, 50 pounds per square inch at the pump. No allowance made for friction in pipes, etc.

Diam. of Steam Cylinder	DIAMETER OF WATER CYLINDERS																	
	2 Inch	2½ Inch	3 Inch	3½ Inch	4 Inch	5 Inch	6 Inch	7 Inch	8 Inch	9 Inch	10 Inch	10½ Inch	12 Inch	14 Inch	16 Inch	18 Inch	20 Inch	
3½	230	147	102	75	58	37												
4	300	192	134	102	75	48	34											
5	469	300	209	153	117	75	52	38										
6	675	432	300	221	169	108	75	55	42	33								
7	920	588	408	300	230	147	102	75	57	45	37							
8	...	768	533	344	300	192	141	98	75	59	48	44						
9	...	972	675	496	380	243	169	124	95	75	61	55	42					
10	...	...	833	612	469	300	208	153	117	94	75	68	50	38			
12	...	...	...	881	675	432	300	220	169	133	108	97	75	55	42		
14	...	...	...	...	920	588	408	300	228	182	147	133	102	75	57	45	
16	...	...	...	...	...	768	564	392	300	236	192	174	141	98	75	59	48
18	...	...	...	...	...	972	650	490	379	300	243	220	162	122	95	75	61
20	...	...	...	...	...	...	833	600	469	370	300	272	208	150	117	92	75
22	...	...	...	...	...	...	1008	741	567	448	364	329	252	185	142	112	91
24	...	...	...	...	...	...	...	882	675	533	432	392	300	220	169	133	108
26	...	...	...	...	...	...	...	1034	788	626	508	460	356	258	197	156	127
28	...	...	...	...	...	...	...	...	919	726	588	533	407	300	230	181	147
30	...	...	...	...	...	...	...	...	1054	834	676	612	468	345	263	208	169
32	...	...	...	...	...	...	...	...	...	948	798	697	533	391	300	237	192
34	...	...	...	...	...	...	...	...	...	1070	868	786	603	442	339	268	217
36	...	...	...	...	...	...	...	...	...	...	972	881	675	495	380	300	243

The maximum limit of piston speed depends upon the head pumped against.

FRICTION LOSS IN POUNDS PRESSURE PER SQUARE INCH

For each 100 feet of length in different size clean iron pipes discharging given quantities of water per minute.

Gallons Discharged Per Minute	½ Inch	¾ Inch	1 Inch	1¼ Inch	1½ Inch	2 Inch	2½ Inch	3 Inch	3½ Inch	4 Inch	5 Inch	6 Inch	Gallons Discharged per Minute
	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	
5	24.6	3.3	.84	.31	.12								5
10	96.0	13.0	3.16	1.05	.47	.12							10
15	...	28.7	6.98	2.38	.97								15
20	...	50.4	12.3	4.07	1.66	.42							20
25	...	78.0	19.0	6.40	2.62	...	.21	.10					25
30	27.5	9.15	3.75	.91							30
35	37.0	12.04	5.05	...							35
40	48.0	16.1	6.52	1.60							40
45	20.2	8.15	...							45
50	24.9	10.0	2.44	.81	.35	.16	.09	.03	...	50
75	56.1	22.4	5.32	1.80	.74	.34	...	.12	.05	75
100	39.0	9.46	3.20	1.31	.60	.33	...	...	100
125	14.9	4.89	1.99	.90	...	...	...	125
150	21.2	7.0	2.85	1.32	.69	.25	.10	150
175	28.1	9.46	3.85	1.78	...	...	...	175
200	37.5	12.48	5.02	2.32	1.22	.42	.17	200
250	19.66	7.76	3.55	1.89	.65	.26	250
300	28.06	11.2	5.23	2.66	.93	.37	300
350	15.2	7.0	3.65	1.28	.50	350
400	19.5	9.0	4.73	1.68	.65	400
450	25.0	11.60	6.01	2.10	.81	450
500	30.8	14.26	7.43	2.70	.96	500

Table continued on next page

FRICTION LOSS IN POUNDS PRESSURE PER SQUARE INCH

Continued

For each 100 feet of length in different size clean iron pipes discharging given quantities of water per minute.

Gallons Discharged per Minute	5 INCH	6 INCH	8 INCH	10 INCH	12 INCH	14 INCH	16 INCH	18 INCH	20 INCH	24 INCH	30 INCH	Gallons Discharged per Minute
	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	Friction Loss in Pounds	
250	.65	.26	.07	.03	.01	....	....	....	....	....	....	250
500	2.70	.96	.25	.09	.04	.017	.009	.005	....	....	....	500
750	5.40	2.21	.53	.18	.08	....	....	....	....	....	....	750
1,000	9.60	3.88	.94	.32	.13	.062	.036	.020	.012	.005	.002	1,000
1,250	1.46	.49	.20	....	....	....	....	....	....	1,250
1,500	2.09	.70	.29	.135	.071	.040	....	....	....	1,500
1,75095	.38	....	....	....	....	....	....	1,750
2,000	1.23	.49	.234	.123	.071	.042	.020	.006	2,000
2,25063	....	....	....	....	....	....	2,250
2,50077	.362	.188	.107	....	....	....	2,500
3,000	1.11	.515	.267	.150	.091	.047	.012	3,000
3,500697	.365	.204	....	....	....	3,500
4,000910	.472	.263	.158	.067	.022	4,000
4,500593	.333	....	....	....	4,500
5,000730	.408	.244	.102	.035	5,000
6,000585	.348	.146	.048	6,000
7,000472	.196	.065	7,000
8,000612	.255	.083	8,000
9,000323	.105	9,000
10,000396	.131	10,000

POUNDS PRESSURE LOST BY FRICTION

In each 100 feet of 2½-inch fire hose, for given discharges of water per minute.

Diameter of Nozzle, inches	PRESSURE AT HOSE NOZZLE									
	Head in pounds per square inch.....									
	Head in feet.....									
	20	30	40	50	60	70	80	90	100	
	46.2	69.3	92.4	115.5	138.6	161.7	184.8	207.9	231.0	
1	Gallons discharged.....	110	134	155	173	189	205	219	232	245
	Rubber hose, pounds.....	4.35	6.40	8.40	10.20	12.80	14.80	17.0	19.20	20.50
	Leather hose, pounds.....	6.33	8.53	10.83	13.10	15.34	17.79	20.11	22.40	24.83
1½	Gallons discharged.....	139	170	196	219	240	259	277	294	310
	Rubber hose, pounds.....	6.79	10.16	13.60	17.05	20.59	24.0	27.0	30.0	33.0
	Leather hose, pounds.....	9.05	12.71	16.38	20.11	23.88	27.61	31.41	35.24	39.07
1¾	Gallons discharged.....	171	210	242	271	297	320	342	363	383
	Rubber hose, pounds.....	10.28	15.64	20.85	25.46	29.50	33.0	43.81	49.42	55.0
	Leather hose, pounds.....	12.84	19.0	24.07	30.11	35.94	41.57	47.36	53.25	59.20
1½	Gallons discharged.....	207	253	293	327	358	387	413	439	462
	Rubber hose, pounds.....	15.0	22.96	29.40	40.50	48.20	55.70	64.70	72.0	79.26
	Leather hose, pounds.....	18.81	26.39	35.01	43.38	52.0	60.40	68.59	76.73	84.87

USEFUL INFORMATION

TABLE OF CAPACITY OF PUMPS

The figures at the extreme left of the table are piston or plunger diameters; the line of figures across the top are piston or plunger strokes; the figures in the body of the table are the capacity or displacement in gallons, corresponding to a single stroke. To find the capacity for one revolution multiply the capacity for a single stroke by two.

Diameter of Cylinder, Inches	LENGTH OF STROKE IN INCHES															38
	2	3	4	5	6	7	12	13	16	18	20	24	25	33	36	
1 1/4	.0106	.0159	.0212	.0266	.0319	.0372	.0638	.0691	.085	.0956	.1062	.1274	.1328	.1753	.1912	.2921
1 1/2	.0120	.0193	.0257	.0321	.0386	.045	.0771	.0835	.1020	.1126	.1286	.1543	.1607	.2121	.2314	.2442
1 3/4	.0153	.0229	.0306	.0382	.0459	.0535	.0918	.0994	.1224	.1377	.1530	.1836	.1912	.2524	.2754	.2907
2	.0208	.0312	.0416	.0521	.0625	.0729	.1249	.1353	.1666	.1874	.2082	.2499	.2603	.3436	.3748	.3956
2 1/4	.0272	.0408	.0544	.0688	.0832	.0976	.1632	.1768	.2176	.2448	.2720	.3264	.340	.4489	.4897	.5169
2 1/2	.0344	.0516	.0688	.0860	.1033	.1205	.2065	.2238	.2754	.3008	.3442	.4131	.4303	.568	.6196	.6541
2 3/4	.0425	.0638	.0850	.1063	.1275	.1488	.255	.2763	.340	.3825	.425	.51	.5313	.7013	.765	.8073
3	.0514	.0771	.1029	.1286	.1543	.18	.3086	.3343	.4114	.4628	.5143	.6171	.6429	.8486	.9257	.9771
3 1/4	.0612	.0918	.1224	.1530	.1836	.2142	.3672	.3978	.4846	.5508	.612	.7344	.765	1.01	1.102	1.163
3 1/2	.0718	.1077	.1437	.1797	.2154	.2514	.431	.4608	.5746	.6404	.7183	.8619	.8978	1.185	1.303	1.365
3 3/4	.0833	.1249	.1666	.2082	.2499	.2915	.4997	.5414	.6663	.7406	.833	.9905	1.041	1.374	1.499	1.583
4	.0957	.1435	.1913	.2392	.287	.3348	.574	.6214	.7653	.8610	.9561	1.148	1.196	1.579	1.722	1.818
4 1/4	.1088	.1632	.2176	.272	.3265	.3809	.653	.7074	.8706	.9795	1.088	1.306	1.36	1.796	1.959	2.068
4 1/2	.1229	.1843	.2457	.3071	.3684	.4300	.7371	.7986	.9828	1.106	1.229	1.474	1.536	2.027	2.211	2.333
4 3/4	.1377	.2065	.2753	.3443	.413	.4818	.826	.8948	1.101	1.239	1.377	1.652	1.721	2.271	2.478	2.616
5	.1534	.2301	.3068	.3835	.4603	.537	.9205	.9972	1.227	1.378	1.534	1.841	1.918	2.531	2.792	2.915
5 1/4	.17	.2550	.34	.4250	.51	.5950	1.02	1.105	1.36	1.53	1.7	2.04	2.125	2.805	3.060	3.23
5 1/2	.1874	.2812	.3749	.4686	.5623	.6561	1.125	1.218	1.5	1.687	1.874	2.249	2.343	3.093	3.374	3.561
5 3/4	.2051	.3086	.4114	.5143	.6171	.72	1.234	1.337	1.646	1.851	2.057	2.468	2.571	3.394	3.703	3.908
6	.2248	.3373	.4497	.5621	.6745	.787	1.349	1.461	1.799	2.023	2.248	2.698	2.811	3.71	4.047	4.272
6 1/4	.2448	.3672	.4896	.612	.7343	.8567	1.469	1.59	1.958	2.203	2.448	2.988	3.06	4.038	4.406	4.65
6 1/2	.2656	.3984	.5312	.6641	.7969	.9297	1.594	1.727	2.125	2.30	2.656	3.188	3.32	4.383	4.781	5.047
6 3/4	.2872	.4300	.5745	.7182	.8618	1.005	1.724	1.867	2.298	2.585	2.873	3.447	3.591	4.74	5.171	5.458
7	.3332	.4999	.6665	.8331	.9997	1.166	1.899	2.016	2.479	2.788	3.099	3.718	3.873	5.113	5.578	5.887
7 1/4	.4084	.6126	.8168	1.021	1.225	1.429	2.45	2.654	3.267	3.675	4.084	4.9	4.165	5.490	5.968	6.332
8	.4352	.6529	.8704	1.089	1.306	1.523	2.611	2.829	3.482	3.917	4.352	5.223	5.44	6.730	7.351	7.759
9	.5508	.8263	1.102	1.377	1.652	1.928	3.305	3.580	4.406	4.957	5.508	6.610	6.885	7.181	7.894	8.269
10	.68	1.02	1.36	1.7	2.04	2.38	4.08	4.42	5.44	6.12	6.8	8.16	8.5	11.22	12.24	12.92
10 1/2	.7497	1.125	1.499	1.874	2.249	2.624	4.498	4.873	5.998	6.747	7.497	8.996	9.37	12.37	13.49	14.24
11	.8228	1.234	1.646	2.057	2.468	2.88	4.997	5.348	6.582	7.405	8.298	9.873	10.28	13.58	14.81	15.63
12	.9792	1.469	1.958	2.448	2.938	3.427	5.875	6.365	7.834	8.813	9.792	11.75	12.24	16.16	17.63	18.6
13	1.149	1.723	2.297	2.872	3.445	4.022	6.894	7.467	9.192	10.34	11.49	13.78	14.36	18.96	20.69	21.83
14	1.332	1.998	2.665	3.331	3.997	4.664	7.994	8.661	10.66	11.99	13.32	15.98	16.66	21.99	23.99	25.32
15	1.53	2.295	3.06	3.825	4.59	5.354	9.18	9.943	12.23	13.77	15.29	18.36	19.12	25.24	27.54	29.07
16	1.74	2.61	3.48	4.35	5.22	6.09	10.44	11.31	13.92	15.66	17.40	20.88	21.76	28.72	31.33	33.07
18	2.203	3.305	4.406	5.508	6.61	7.711	13.22	14.32	17.62	19.82	22.03	26.44	27.54	36.35	39.66	41.86
20	2.720	4.08	5.440	6.8	8.16	9.52	16.32	17.68	21.76	24.48	27.2	32.64	34	44.88	48.96	51.68
22	3.291	4.936	6.582	8.228	9.874	11.52	19.75	21.39	26.33	29.62	32.91	39.49	41.14	54.3	59.24	62.53
24	3.916	5.875	7.833	9.792	11.75	13.71	23.5	25.46	31.33	35.25	39.16	47.0	48.96	64.63	70.50	74.42

TABLE FOR EQUALIZING PIPES

Size of Main Pipe	NUMBER OF BRANCHES														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 in.	.758	.644	.574	.525	.488	.459	.435	.415	.398	.383	.370	.358	.348	.338	.330
1½ "	.985	.838	.747	.683	.635	.597	.556	.540	.518	.498	.482	.466	.452	.440	.428
1½ "	1.14	.967	.861	.788	.733	.689	.653	.623	.597	.575	.555	.538	.522	.508	.494
2 "	1.52	1.29	1.15	1.05	.977	.918	.870	.830	.796	.766	.740	.717	.696	.677	.660
2½ "	1.89	1.61	1.44	1.31	1.22	1.15	1.09	1.09	.995	.958	.925	.896	.870	.846	.825
3 "	2.27	1.92	1.72	1.58	1.47	1.38	1.31	1.25	1.19	1.15	1.11	1.08	1.04	1.02	.989
3½ "	2.65	2.26	2.01	1.84	1.71	1.61	1.52	1.45	1.39	1.34	1.30	1.25	1.22	1.18	1.15
4 "	3.03	2.58	2.30	2.10	1.95	1.84	1.74	1.66	1.59	1.53	1.48	1.43	1.39	1.35	1.32
4½ "	3.41	2.90	2.58	2.36	2.20	2.07	1.96	1.87	1.79	1.72	1.67	1.61	1.57	1.52	1.48
5 "	3.79	3.22	2.87	2.63	2.44	2.30	2.18	2.08	1.99	1.92	1.85	1.79	1.74	1.69	1.65
6 "	4.55	3.87	3.45	3.15	2.93	2.75	2.61	2.49	2.39	2.30	2.22	2.15	2.09	2.03	1.98
7 "	5.30	4.51	4.02	3.68	3.42	3.21	3.05	2.91	2.79	2.68	2.59	2.51	2.44	2.37	2.31
8 "	6.06	5.16	4.59	4.20	3.91	3.67	3.48	3.32	3.18	3.09	2.96	2.87	2.78	2.71	2.64
9 "	6.82	5.80	5.17	4.73	4.40	4.13	3.92	3.74	3.58	3.45	3.33	3.23	3.13	3.04	2.97
10 "	7.58	6.44	5.74	5.25	4.88	4.59	4.35	4.15	3.98	3.83	3.70	3.59	3.48	3.38	3.30
12 "	9.08	7.73	6.89	6.30	5.86	5.51	5.22	4.98	4.78	4.60	4.44	4.30	4.18	4.06	3.96

AIR CONSUMPTION AT SEA LEVEL OF STANDARD SIZE ROCK DRILLS

Size of Cylinder	2	2¼	2½	2¾	3	3½	3¾	3½
Usual Diameter of Hole Drilled	1-1½	1½-1½	1-2	1¾-2½	1½-3	1½-3	1½-3	1¾-3
Air Pressures	Air Consumption at Sea Level of one Drill—Cubic feet per minute of free air							
60	60	65	70	80	90	100	110	120
70	70	75	80	90	105	115	125	135
80	80	85	90	100	115	130	140	150
90	85	90	95	115	130	140	150	170
100	95	100	110	125	140	155	170	185

MULTIPLICATION FACTORS FOR ALTITUDE AND NUMBER OF DRILLS

Altitude of Plant, Feet Above Sea Level	NUMBER OF DRILLS														
	1	2	3	4	5	6	7	8	9	10	11	12	15	20	30
	Combined Factors														
0	1.	1.8	2.6	3.35	4.10	4.8	5.45	6.10	6.75	7.45	8.05	8.7	10.65	13.9	20.2
1,000	1.03	1.85	2.67	3.45	4.25	4.95	5.6	6.3	6.95	7.6	8.3	9.	11.	14.4	20.8
2,000	1.06	1.91	2.75	3.55	4.35	5.1	5.8	6.5	7.2	7.9	8.5	9.2	11.3	14.7	21.5
3,000	1.09	1.96	2.83	3.65	4.5	5.2	5.95	6.65	7.35	8.1	8.8	9.5	11.6	15.2	22.8
4,000	1.13	2.03	2.94	3.8	4.6	5.4	6.15	6.9	7.65	8.4	9.1	9.8	12.	15.7	23.6
5,000	1.17	2.1	3.04	3.9	4.8	5.6	6.4	7.1	7.9	8.7	9.4	10.2	12.4	16.2	24.
6,000	1.21	2.18	3.15	4.06	4.96	5.8	6.6	7.4	8.2	9.	9.75	10.6	12.9	16.8	24.7
7,000	1.25	2.25	3.25	4.2	5.15	6.	6.8	7.65	8.45	9.3	10.	10.9	13.3	17.4	25.3
8,000	1.29	2.32	3.35	4.35	5.3	6.2	7.05	7.9	8.7	9.6	10.4	11.3	13.8	18.	26.1
9,000	1.33	2.4	3.47	4.48	5.5	6.4	7.3	8.15	9.	9.9	10.7	11.6	14.2	18.6	27.
10,000	1.38	2.5	3.6	4.65	5.7	6.65	7.55	8.45	9.35	10.3	11.2	12.1	14.8	19.3	28.
12,000	1.48	2.67	3.86	5.	6.1	7.15	8.1	9.1	10.	11.	12.	13.	15.8	20.6	30.

As an example of the use of these rock-drill tables, we may assume that an outfit of ten 3-inch drills is projected at an altitude of 9,000 feet, and that it is proposed to carry 70 pounds pressure at the drills. The compressor displacement suitable for such a plant is required.

From table above we find that one 3-inch drill at sea-level uses at 70 pounds pressure the equivalent of 105 cubic feet per minute of free air. The factor of multiplication for 10 drills at 9,000 feet altitude is figured as 9.9. Multiplying 105 by 9.9 gives 1039.5 cubic feet per minute as the displacement of a compressor suitable, under average conditions, for such a plant.

USEFUL INFORMATION

WEIGHTS OF PIPE FITTINGS

In Pounds, Per Hundred

Size, Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Bushings	5	13	25	45	58	71	104	163	218	300	312	375	612
Caps, cast	13	23	34	57	73	121	205	229	290	455	750	800	1,500
* Caps, malleable	15	25	46	61	85	140	150	265	400	440	575	975	1,050
Couplings	18	31	43	70	100	130	130	130	130	130	130	130	130
Couplings, R. & L.	25	45	80	145	195	315	540	945	1,100	1,575	1,575	1,575	1,575
Crosses, malleable	40	70	100	145	180	290	535	740	1,100	1,400	1,585	2,200	3,400
Elbows, cast	25	40	60	90	125	190	310	510	855	960	960	960	960
Elbows, malleable	40	55	85	130	160	250	415	565	800	1,000	1,300	1,500	2,400
Elbows, 45°, cast	22	35	60	90	110	200	275	355	430	480	480	480	480
Elbows, 45°, malleable	25	40	65	90	135	220	395	520	720	920	1,120	1,580	2,580
Elbows, malleable, street	165	275	440	640	815	1,025	1,415	1,525	1,800	2,400	2,765	2,765	2,765
Flange unions, cast	6	10	16	18	30	47	47	47	47	47	47	47	47
Flange unions, malleable	6	11	16	21	25	50	80	120	140	180	265	335	335
Lock-nuts, malleable	6	8	10	15	17	26	40	48	63	65	100	125	125
Nipples, close	9	15	20	35	50	80	120	140	260	300	420	500	630
Nipples, per inch	12	25	35	50	80	125	220	300	460	465	1,050	1,400	1,900
Reducers, cast	12	25	35	50	80	125	220	300	460	465	1,050	1,400	1,900
Reducers, malleable	90	140	200	290	510	720	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Return bends, cast, close pattern	120	175	270	350	560	1,000	1,350	1,350	1,350	1,350	1,350	1,350	1,350
Return bends, cast, open pattern	39	65	90	135	205	300	300	300	300	300	300	300	300
Return bends, malleable, close pat.	40	70	120	165	250	340	515	840	840	840	840	840	840
Return bends, malleable, open pat.	65	85	135	190	270	425	755	1,065	1,375	2,045	2,200	2,925	3,470
Tees, cast	25	45	80	115	160	240	410	650	890	1,210	1,210	1,210	1,210
Tees, malleable	65	95	150	210	300	470	830	1,175	1,510	2,250	2,420	3,220	3,820
Tees, reducing	50	75	100	125	150	250	440	515	515	515	515	515	515
Unions, malleable	50	75	100	125	150	250	440	515	515	515	515	515	515

WEIGHTS OF COCKS AND BRASS VALVES

In Pounds, Each

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Cocks, asbestos packed	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Cocks, bibb	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Cocks, brass service	1/8	1/2	1 1/2	2 1/2	4	7	11	14	20	35	58	58	58
Cocks, brass steam	1/8	1/2	1 1/2	2 1/2	4	7	11	14	20	35	58	58	58
Cocks, rough stop	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Cocks, straight-way, all iron	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Cocks, straight-way, brass plug	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Cocks, 3-way, all iron	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, blow-off, Jenkins	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, check, horizontal	1/4	1/2	3/4	1	1 1/4	2	4	7	11	18	28	41	57
Valves, check, Jenkins swing	1/4	1/2	3/4	1	1 1/4	2	4	7	11	18	28	41	57
Valves, check, standard horizontal	1/8	1/4	1/2	1	2	3	5	7	11	19	29	44	67
Valves, check, standard swing	1/8	1/4	1/2	1	2	3	5	7	11	19	29	44	67
Valves, check, standard vertical	1/8	1/4	1/2	1	2	3	5	7	11	19	29	44	67
Valves, gate, Lunkenheim	1/4	1/2	3/4	1	1 1/4	2	4	7	11	18	28	41	57
Valves, gate, Chapman	1/4	1/2	3/4	1	1 1/4	2	4	7	11	18	28	41	57
Valves, gate, standard	1/8	1/4	1/2	1	2	3	5	7	11	19	29	44	67
Valves, globe, Jenkins	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, globe, Lunkenheim	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, globe, Standard	1/4	1/2	3/4	1	1 1/4	2	4	7	11	18	28	41	57
Valves, safety, lever	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, safety pop, standard	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, safety pop, Lunkenheim	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, throttle, standard	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, throttle, Lunkenheim	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58
Valves, whistle	1	1 1/2	2	4	7	11	14	20	35	58	58	58	58

USEFUL INFORMATION

WEIGHTS OF IRON BODY VALVES

In Pounds, Each

SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Blow-off, Jenkins					53	64										
Check, Jenkins horizontal					28	40	50	64	86	100	142					
Check, Jenkins swing					32	44	49	64								
Check, standard horizontal					14	20	30	52	56	90	125					
Check, standard swing					19	30	45	50								
Check, standard vertical					16	28	39	52	54							
Foot, with strainer	2	3	4	6	7	10	12	16	20	30	45	120	140		200	350
Gate, hub end					50			88				170	280		450	680
Gate, standard, screwed				20	28	42	50	63	67	102	135	200	240	300	410	415
Gate, standard flanged					37	55	60	75	85	125	155	210	280	330	425	
Gate, Lunkenheimer	4	5	6	10	18	40	45	60								
Gate, Lunkenheimer, all iron	4	5	6	10	18	40	45	58								
Globe, std. screwed, no yoke				11	16	23										
Globe, std. screwed, with yoke				17	22	32	43	54	70	90	130	180	240			
Globe, Jenkins screwed				22	35	60	70	100	120	140	210	280	380			
Globe, Jenkins flanged										160	230		420			
Safety, standard lever				20	36	57	80	100	105	125	170	240	290			
Safety, standard pop					57	75	105	125								
Throttle, standard screwed				45	50	70	95									
Throttle, Lunkenheimer				35	40	50	65									

WEIGHTS OF FLANGED, EXTRA HEAVY AND LONG SWEEP PIPE FITTINGS

In Pounds, Each

SIZE, INCHES	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Standard flanged tees				20	25	40	45	55	60	85	110	145	180	220	235	390
Standard flanged elbows				15	18	25	30	40	50	60	70	95	120	145	180	260
Standard flanged crosses				30	35	50	60	80	100	120	140	190	240	290	360	520
Extra heavy flanged tees				30	40	65	75	90	115	130	180	240	290	330	420	590
Extra heavy flanged elbows				20	25	45	50	60	80	95	120	160	190	230	300	400
Extra heavy flanged crosses				40	50	90	100	120	160	190	240	320	380	440	600	800
Extra heavy screwed tees	1 1/2	2	3	5	8	10	13	18	23	28	44	65	85	115	143	205
Extra heavy screwed elbows	1	1 1/2	2	3	6	7	9	12	16	20	32	47	62	84	104	150
Extra heavy screwed crosses	2	2 1/2	3	6	10	13	16	21	27	33	51	76	100	135	165	235
Long sweep tees	2	3	4	6	11	15	19	24	30	42	60	92	122	165	210	285
Long sweep elbows	1 1/2	2	2 1/2	4	7	11	13	16	20	28	40	60	80	110	140	190
Long sweep crosses			5	8	15	22	26	32		55	80	125	165	225	290	390

WEIGHTS OF EXPANSION JOINTS

Iron Body. Brass Sleeve

SIZE, INCHES	2x2 1/2	2 1/2x2 1/2	3x2 1/2	3 1/2x3	4x3 1/2	5x4	6x5	7x6	8x7	10x7	12x8
Screwed, each, pounds	9	13	19	28	36	63	90	120	170	235	390
Flanged, each, pounds	20	30	35	45	55	80	110		200	275	450

STANDARD THREADS FOR BOLTS

Giving the Number of Threads Per Inch for Each Form

SIZE, INCHES	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
V-thread	20	18	16	14	12	11	10	9	8	7	7	6	6	5	5	4 1/2	4 1/2
U. S. Standard	20	18	16	14	13	11	10	9	8	7	7	6	6	5 1/2	5	5	4 1/2
Whitworth	20	18	16	14	12	11	10	9	8	7	7	6	6	5	5	4 1/2	4 1/2

V-form thread is supplied unless otherwise ordered.

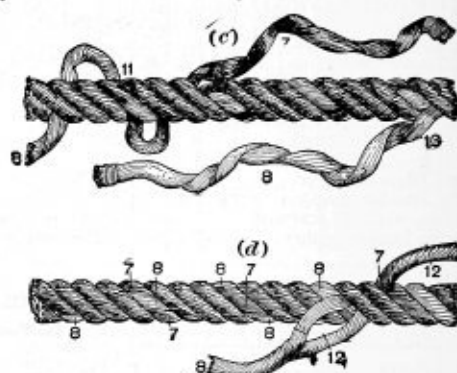
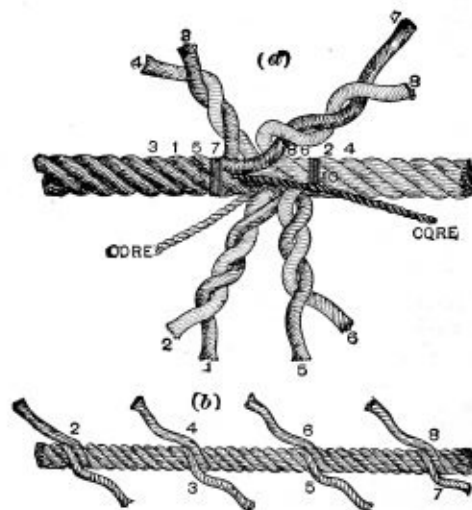
HORSE-POWER TRANSMITTED BY MANILA ROPES

Work Strain = 200 d² Pounds d = Diameter of Rope in Inches

Diam: of rope, inches	SPEED OF THE ROPE IN FEET PER MINUTE											
	1000	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000
5/8	1.24	2.70	3.30	3.83	4.30	4.74	5.01	5.29	5.29	5.08	4.74	4.12
3/4	2.25	3.84	4.71	5.46	6.23	6.83	7.24	7.47	7.60	7.32	6.83	5.93
1	3.57	6.84	8.38	9.80	11.09	12.15	12.89	13.29	13.53	13.10	12.13	10.54
1 1/4	5.59	10.68	13.10	15.39	17.33	18.98	20.15	20.76	21.14	20.36	19.00	16.47
1 1/2	8.02	15.39	18.86	21.87	24.94	27.33	29.00	29.89	30.43	29.32	27.34	23.72
1 3/4	10.85	20.93	25.66	29.74	34.03	37.17	39.45	40.65	41.39	39.77	37.21	32.26
2	14.20	27.36	33.54	38.88	44.35	48.59	51.57	53.15	54.11	52.12	48.63	42.18

The table shows the effect of centrifugal force in diminishing the power transmitted under an assumed working tension and would indicate that with tensions of 200 d² pounds, the speed should not exceed 5500 feet per minute.

SPLICING MANILA TRANSMISSION ROPES



The successive operations for making a common or English splice in a 1 3/4-inch 4 strand rope is as follows:

1. Tie a piece of twine, 9 and 10, around the rope to be spliced, about six feet from each end. Then unlay the strands of each end back to the twine.

2. Put the ropes together and twist each corresponding pair of strands loosely, to keep them from being tangled, as shown at (a).

3. The twine 10 is now cut, and the strand 8 unlay and strand 7 carefully laid in its place for a distance of four and a half feet from the junction.

4. The strand 6 is next unlay about one and a half feet and strand 5 laid in its place.

5. The ends of the cores are now cut off so they just meet.

6. Unlay strand 1 four and a half feet, laying strand 2 in its place.

7. Unlay strand 3 one and a half feet, laying in strand 4.

8. Cut all the strands off to a length of about twenty inches, for convenience in manipulation. The rope now assumes the form shown in (b), with the meeting points of the strands three feet apart.

Each pair of strands is now successively subjected to the following operations:

9. From the point of meeting of the strands 8 and 7 unlay each one three turns; split both the strand 8 and the strand 7 in halves, as far back as they are now unlay, and the end of each half strand "whipped" with a small piece of twine.

10. The half of the strand 7 is now laid in three turns, and the half of 8 also laid in three turns. The half strands now meet and are tied in a simple knot 11, (c), making the rope at this point its original size.

11. The rope is now opened with a marlinspike, and the half strand of 7 worked around the half strand of 8 by passing the end of the half strand through the rope, as shown, drawn taut, and again worked around this half strand until it reaches the half strand 13 that was not laid in. This half strand 13 is now split, and the half strand 7 drawn through the opening thus made, and then tucked under the two adjacent strands, as shown in (d).

12. The other half of the strand 8 is now wound around the other half strand 7 in the same way. After each pair of strands has been treated in this manner, the ends are cut off at 12, leaving them about four inches long. After a few days' wear they will draw into the body of the rope or wear off, so that the locality of the splice can scarcely be detected.

The chief trouble in the past, with rope transmission, has been in defective splicing. We have a corps of expert splicers to send out at any time.

HORSE-POWER OF BELTING

A simple rule for ascertaining transmitting power of belting, without first computing speed per minute that it travels, is as follows: Multiply diameter of pulley in inches by its number of revolutions per minute, and this product by width of the belt in inches; divide this product by 3,300 for single belting, or by 2,100 for double belting, and the quotient will be the amount of horse-power that can be safely transmitted.

For Single Leather, Four Ply Rubber and Four Ply Cotton Belting, Belts Not Overloaded

1 inch wide, 800 feet per minute=1 Horse-power

Speed in feet per minute	WIDTH OF BELT IN INCHES											
	2 H. P.	3 H. P.	4 H. P.	5 H. P.	6 H. P.	8 H. P.	10 H. P.	12 H. P.	14 H. P.	16 H. P.	18 H. P.	20 H. P.
400	1	1½	2	2½	3	4	5	6	7	8	9	10
600	1½	2¼	3	3¾	4½	6	7½	9	10½	12	13¾	15
800	2½	3	4	5	6	8	10	12	14	16	18	20
1000	2	3¾	5	6¼	7½	10	12½	15	17½	20	22½	25
1200	3	4½	6	7½	9	12	15	18	21	24	27	30
1500	3¾	5¾	7½	9½	11½	15	18¾	22½	26½	30	33¾	37½
1800	4½	6¾	9	11¼	13½	18	22½	27	31½	36	40½	45
2000	5	7½	10	12½	15	20	25	30	35	40	45	50
2400	6	9	12	15	18	24	30	36	42	48	54	60
2800	7	10½	14	17½	21	28	35	42	49	56	63	70
3000	7½	11¼	15	18¾	22½	30	37½	45	52½	60	67½	75
3500	8¾	13	17½	22	26	35	44	52½	61	70	79	88
4000	10	15	20	25	30	40	50	60	70	80	90	100
4500	11¼	17	22½	28	34	45	57	69	78	90	102	114
5000	12½	19	25	31	37½	50	62½	75	87½	100	112	125

Double leather, six-ply rubber or six-ply cotton belting will transmit 50 to 75 per cent more power than is shown in this table. (One-inch wide, 550 feet per minute = one horse-power).

RULES FOR DETERMINING DIAMETER AND SPEED OF ROPE SHEAVES, PULLEYS OR GEARS

The driving pulley is called the Driver, and the driven pulley the Driven.

If the number of teeth in gears are used instead of diameter, in these calculations, number of teeth must be substituted wherever diameter occurs.

To determine the diameter of Driver, the diameter of the Driven and its revolutions, and also the revolutions of Driver being given:

$$\frac{\text{Diameter of Driven} \times \text{revolutions of Driven}}{\text{Revolutions of Driver}} = \text{Diam. of Driver}$$

To determine the diameter of Driven, the revolutions of the Driven, and diameter and revolutions of the Driver being given:

$$\frac{\text{Diameter of Driver} \times \text{revolutions of Driver}}{\text{Revolutions of Driven}} = \text{Diam. of Driven.}$$

To determine the revolutions of the Driver, the diameter and revolutions of the Driven, and diameter of the Driver being given:

$$\frac{\text{Diameter of Driven} \times \text{revolutions of Driven}}{\text{Diameter of Driver}} = \text{Rev. of Driver}$$

To determine the revolutions of the Driven, the diameter and revolutions of the Driver, and diameter of the Driven being given:

$$\frac{\text{Diameter of Driver} \times \text{revolutions of Driver}}{\text{Diameter of Driven}} = \text{Rev. of Driven}$$

Note—Rope sheaves should be at least 60 diameters of the rope, never less than 40, as the durability of the rope depends entirely upon this factor.

The diameter of pulleys should be as large as can be admitted, provided they will not produce a belt travel greater than 5,000 feet per minute. About 4,000 feet, and low tension is good practice.

RULES FOR HORSE-POWER OF GEARING

Face in inches x square of thickness of Tooth at pitch line in inches x velocity

Length of Tooth from point to root in inches x 53

Equals horse-power at safety of 8; ultimate tensile strength, 30,000 pounds per square inch. Velocity to be in feet per minute at pitch line.

For bevels, thickness, length and velocity to be taken at center of face. For mortise wheels and pinions use thickness of pinion tooth. If greater margin of safety is desired, multiply above result by 8 and divide by factor of safety desired; 2,200 feet per minute at pitch line for iron gearing, and 3,000 feet for wood and iron, are excessive velocities, and should be avoided, if possible.

HORSE-POWER TO DRIVE CONVEYORS

The capacity of conveyor being generally given in bushels per hour, find the weight of the material to be carried by multiplying the number of bushels by the weight per bushel. Divide by 60 to find the weight to be carried per minute. Multiply the result by the length of the conveyor in feet, divide the product by 33,000, and divide by 3. The result will be the horse-power required.

CAPACITIES OF TROUGHED CONVEYOR BELTS

IN CUBIC FEET OF MATERIAL DELIVERED PER HOUR AT A SPEED OF 100 FEET PER MINUTE

The capacity of such conveying belts is in direct proportion to the speed. The speed at which a belt can be run depends upon the character of the material to be carried, and upon the special conditions of each case; 750 feet per minute is not an extraordinary speed for grain-carrying belts.

Width of Belt, inches.....	12	14	16	18	20	22	24	26	28	30	32	34	36
Capacity in cubic feet	187	255	333	413	521	630	750	880	1020	1170	1333	1505	1687
Capacity in bushels	150	200	265	332	418	506	602	707	820	940	1117	1210	1355

HORSE-POWER TO DRIVE ELEVATORS

The capacity of elevators being generally given in bushels per hour, find the number of pounds elevated per hour by multiplying the number of bushels by the weight of each bushel; dividing this by 60 will give the number of pounds lifted per minute.

Multiply the number of pounds lifted per minute by the height of the elevator, and divide the product by 33,000. The result will give the theoretical horse-power necessary, to which should be added 50 per cent for friction.

CAPACITY OF ELEVATORS

Size of Bucket	Distance Apart, Center to Center, Inches	Diameter of Head Pulley, Inches	Speed of Head Shaft, Revolutions per Minute	Speed of Belt, Feet per Minute	Capacity, Bushels per Hour
2 x2	10	16	48	200	28
2½x2½	10	16	48	200	50
3 x3	10	18	45	215	88
3½x3	10	18	45	215	98
4 x3	12	20	42	220	140
4½x3½	12	20	42	220	198
5 x4	12	20	42	220	264
5½x4	12	24	40	250	350
6 x4	12	24	40	250	430
7 x4½	12	24	40	250	614
8 x5	12	30	38	300	974
9 x5½	16	30	38	300	1,216
10 x5½	16	36	36	340	1,637
11 x6	16	40	34	360	2,309
12 x6½	16	40	34	360	2,820
14 x6½	16	48	32	400	3,134
16 x6½	16	48	32	400	4,450
18 x7	16	54	31	440	6,393
20 x7	16	60	30	470	7,450

The above table of capacity applies only to buckets with round bottom and corners, which, owing to their peculiar shape, take full load and discharge perfectly.

In figuring capacity of ordinary buckets a deduction of about 10 per cent should be made.

The size of pulleys and speed of belts given above are intended only to cover the average practice as to these items. With larger pulleys a greater belt speed may be used with satisfactory discharge of the buckets and with increased capacity.

GEAR DIAMETERS

Table for finding the diameter of a gear when the pitch is given, or the pitch of a gear when the diameter is given, that shall contain from 10 to 250 teeth, and any pitch required.

RULE:—Multiply X in the table by the pitch given and the product will be the pitch diameter of the gear required. Or, divide the pitch diameter of the gear by X in the table and the quotient will be the pitch of the gear required.

Teeth	X	Teeth	X	Teeth	X	Teeth	X	Teeth	X	Teeth	X
10	3.236	51	16.244	92	20.290	133	42.338	174	55.388	215	68.430
11	3.550	52	16.562	93	20.608	134	42.656	175	55.706	216	68.748
12	3.864	53	16.880	94	20.926	135	42.974	176	56.026	217	69.066
13	4.178	54	17.198	95	20.244	136	43.294	177	56.344	218	69.384
14	4.494	55	17.516	96	20.562	137	43.612	178	56.662	219	69.702
15	4.810	56	17.834	97	20.880	138	43.930	179	56.980	220	70.020
16	5.126	57	18.152	98	21.200	139	44.248	180	57.298	221	70.338
17	5.442	58	18.470	99	21.518	140	44.566	181	57.596	222	70.656
18	5.758	59	18.790	100	21.836	141	44.884	182	57.934	223	70.974
19	6.076	60	19.108	101	22.154	142	45.204	183	58.254	224	71.292
20	6.392	61	19.426	102	22.472	143	45.522	184	58.564	225	71.610
21	6.710	62	19.744	103	22.790	144	45.840	185	58.882	226	71.930
22	7.026	63	20.062	104	23.108	145	46.158	186	59.200	227	72.248
23	7.344	64	20.380	105	23.426	146	46.476	187	59.518	228	72.568
24	7.662	65	20.698	106	23.744	147	46.794	188	59.836	229	72.886
25	7.978	66	21.016	107	24.064	148	47.112	189	60.154	230	73.184
26	8.296	67	21.334	108	24.382	149	47.432	190	60.472	231	73.502
27	8.614	68	21.652	109	24.700	150	47.750	191	60.792	232	73.820
28	8.932	69	21.970	110	25.018	151	48.068	192	61.110	233	74.158
29	9.250	70	22.288	111	25.336	152	48.386	193	61.428	234	74.476
30	9.566	71	22.606	112	25.654	153	48.704	194	61.746	235	74.796
31	9.884	72	22.926	113	25.974	154	49.022	195	62.064	236	75.114
32	10.202	73	23.244	114	26.292	155	49.340	196	62.382	237	75.432
33	10.520	74	23.562	115	26.610	156	49.660	197	62.700	238	75.750
34	10.838	75	23.880	116	26.928	157	49.978	198	63.020	239	76.068
35	11.156	76	24.198	117	27.246	158	50.296	199	63.338	240	76.386
36	11.474	77	24.516	118	27.564	159	50.614	200	63.656	241	76.704
37	11.792	78	24.834	119	27.882	160	50.932	201	63.974	242	77.024
38	12.110	79	25.152	120	28.202	161	51.250	202	64.292	243	77.342
39	12.428	80	25.470	121	28.520	162	51.568	203	64.610	244	77.660
40	12.746	81	25.788	122	28.838	163	51.888	204	64.928	245	77.978
41	13.064	82	26.102	123	29.156	164	52.206	205	65.246	246	78.296
42	13.382	83	26.420	124	29.474	165	52.524	206	65.564	247	78.614
43	13.700	84	26.740	125	29.792	166	52.842	207	65.882	248	78.934
44	14.018	85	27.062	126	30.110	167	53.160	208	66.200	249	79.252
45	14.336	86	27.382	127	30.428	168	53.478	209	66.518	250	79.570
46	14.654	87	27.708	128	30.748	169	53.798	210	66.838	...	...
47	14.972	88	28.016	129	31.066	170	54.116	211	67.156	...	...
48	15.290	89	28.336	130	31.384	171	54.434	212	67.474	...	...
49	15.608	90	28.654	131	31.702	172	54.752	213	67.792	...	...
50	15.926	91	28.972	132	32.020	173	55.070	214	68.112	...	...

CIRCULAR PITCHES WITH THEIR CORRESPONDING DIAMETRAL PITCHES

Circular Pitch	Diametral Pitch	Circular Pitch	Diametral Pitch	Circular Pitch	Diametral Pitch	Circular Pitch	Diametral Pitch
$\frac{3}{4}$ in.	4.1888	$1\frac{1}{4}$ in.	2.5133	$2\frac{1}{2}$ in.	1.2566	$4\frac{1}{2}$ in.	.6983
$\frac{7}{8}$ "	3.5904	$1\frac{1}{2}$ "	2.0944	3 "	1.0472	5 "	.6283
1 "	3.1416	$1\frac{3}{4}$ "	1.7952	$3\frac{1}{2}$ "	.8976	$5\frac{1}{2}$ "	.5711
$1\frac{1}{8}$ "	2.7925	2 "	1.5708	4 "	.7854	6 "	.5236

DIAMETRAL PITCH—EQUIVALENT IN CIRCULAR PITCHES

Diametral Pitch	Circular Pitch	Diametral Pitch	Circular Pitch	Diametral Pitch	Circular Pitch	Diametral Pitch	Circular Pitch
$\frac{1}{2}$ in.	6.2832	$2\frac{3}{4}$ in.	1.1424	10 in.	.3142	26 in.	.1208
$\frac{3}{4}$ "	4.1888	3 "	1.0472	11 "	.2856	28 "	.1122
1 "	3.1416	$3\frac{1}{2}$ "	.8976	12 "	.2618	30 "	.1047
$1\frac{1}{4}$ "	2.5133	4 "	.7854	14 "	.2244	32 "	.0982
$1\frac{1}{2}$ "	2.0944	5 "	.6283	16 "	.1963	36 "	.0873
$1\frac{3}{4}$ "	1.7952	6 "	.5236	18 "	.1745	40 "	.0785
2 "	1.5708	7 "	.4488	20 "	.1571	48 "	.0654
$2\frac{1}{4}$ "	1.3963	8 "	.3927	22 "	.1428	.....	.....
$2\frac{1}{2}$ "	1.2566	9 "	.3491	24 "	.1309	.....	.....

USEFUL INFORMATION

APPROXIMATE WEIGHT OF HOSE

In Pounds, Per Length of 50 Feet

SIZE, INCHES.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4
Water, 3-ply.....	13	19	24	32	38	49	70	80	115
Water, 4-ply.....	22	30	37	46	54	70	80	115	
Steam, 4-ply.....	18	24	30	37	46	54	70	80	115
Steam, 5-ply.....	22	30	37	46	54	70	80	115	
Steam, 6-ply.....	40	50	60	70	80	95			
Air, wire-wound, 4-ply.....	41								
Air, wire-wound, 5-ply.....	50								
Rubber-lined cotton.....	10	15	20	25	30	30			
Unlined linen.....	5	6	7	8	10	10			

APPROXIMATE WEIGHT OF RUBBER BELTING

Width, inches.....	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Ply.....	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Per foot, ounces.....	6	8	10	12	15	16	8	9	13	14	18	19	22	24								
Width, inches.....	12	14	16	6	7	8	9	10	12	14	8	9	10	11	12	13	14	15	16	17	18	19
Ply.....	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
Per foot, ounces.....	28	34	39	18	21	24	27	30	35	43	28	33	35									

APPROXIMATE WEIGHT OF LEATHER BELTING

In Pounds, Per 100 Feet

WIDTH, INCHES.....	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6
Single, pounds.....	8	12	16	20	24	28	32	40	48
Light double, pounds.....	12	18	24	30	36	42	48	60	72
Extra heavy double, pounds.....	16	24	32	40	48	56	64	80	96

Greater widths are in direct proportion.

TEE-RAILS AND TRACK EQUIPMENT

RAILS, SPLICES, SPIKES AND BOLTS

For Single Track (Two Rails) Ties 2 Feet Center to Center, 4 Spikes Each.

SIZE OF RAILS, POUNDS, PER YARD.....	8	12	16	20	25	30	40
Rails, per mile, tons of 2,000 pounds.....	14.08	21.12	28.16	35.20	44.00	52.80	70.40
Rails, per 100 feet, pounds.....	533	800	1,067	1,333	1,667	2,000	2,667
Splice bars, weight, per pair, pounds.....	21	3.44	4.36	4.86	5.70	10.45	16.10
Splikes, size under head, inches.....	2x2 $\frac{1}{2}$	$\frac{3}{4}$ x2 $\frac{1}{2}$	$\frac{3}{4}$ x3	$\frac{3}{4}$ x3 $\frac{1}{2}$	$\frac{3}{4}$ x3 $\frac{1}{2}$	$\frac{1}{2}$ x4	$\frac{1}{2}$ x4 $\frac{1}{2}$
Splikes, per mile, pounds.....	978	1,320	1,542	1,790	1,790	3,520	3,985
Splikes, per 100 feet, pounds.....	19	25	30	35	33	67	76
Splikes, per ton rails, pounds.....	70	63	55	51	41	67	56
Splikes, number per keg of 200 pounds.....	2,160	1,600	1,370	1,180	1,180	600	530
Bolts, size, inches.....	$\frac{3}{4}$ x1 $\frac{1}{2}$	$\frac{3}{4}$ x1 $\frac{1}{2}$	$\frac{3}{4}$ x2				
Bolts, number per keg of 200 pounds.....	1,800	1,800	1,560				

NEAREST NUMBER OF RAILS, SPLICES AND BOLTS

For Single Track (2 Rails)

LENGTH OF RAILS, FEET.....	12	13	14	15	16	18	20	22	24	30
Per 100 feet, number of rails.....	17	15	14	13	12	11	10	9	8	7
Per 100 feet, pairs splikes.....	17	15	14	13	12	11	10	9	8	7
Per 100, number bolts, 4 per joint.....	68	60	56	52	48	44	40	36	32	28
Per 100, number bolts, 2 per joint.....	34	30	28	26	24	22	20	18	16	14
Per mile, number rails.....	880	813	755	704	660	578	528	480	440	352
Per mile, pairs splikes.....	880	813	755	704	660	578	528	480	440	352
Per mile, number bolts, 4 per joint.....	3,520	3,252	3,020	2,816	2,640	2,312	2,112	1,920	1,760	1,408
Per mile, number bolts, 2 per joint.....	1,760	1,626	1,510	1,408	1,320	1,156	1,056	960	880	704
8-pound rails, number, per ton.....	62.5	57.7	53.6	50.0	46.9	41.7	37.5	34.1	31.3	25.0
12-pound rails, number, per ton.....	41.7	38.5	35.7	33.3	31.3	27.8	25.0	22.8	20.8	16.7
16-pound rails, number, per ton.....	31.3	28.9	26.8	25.0	23.4	20.8	18.8	17.1	15.6	12.5
20-pound rails, number, per ton.....	25.0	23.1	21.4	20.0	18.8	16.7	15.0	13.6	12.5	10.0
25-pound rails, number, per ton.....	20.0	18.5	17.1	16.0	15.0	13.3	12.0	10.9	10.0	8.0
30-pound rails, number, per ton.....	16.7	15.4	14.3	13.3	12.5	11.1	10.0	9.1	8.3	6.7
40-pound rails, number, per ton.....	12.5	11.5	10.7	10.0	9.3	8.3	7.5	6.8	6.3	5.0

HORSE POWER OF TURNED SHAFTING—(Kent)

As second movers or line shafting, bearings eight feet apart.

$$\text{Formula: H.P.} = \frac{D^3 \times R}{90}$$

DIAMETER OF SHAFT	NUMBER OF REVOLUTIONS PER MINUTE										
	100	125	150	175	200	225	250	275	300	325	350
1 $\frac{1}{8}$	6.	7.4	8.9	10.4	11.9	13.4	14.9	16.4	17.9	19.4	20.9
1 $\frac{3}{8}$	8.9	11.1	13.3	15.5	17.7	20.	22.2	24.4	26.6	28.8	31.
2 $\frac{3}{8}$	12.6	15.8	19.	22.	25.	28.	31.	35.	38.	41.	44.
2 $\frac{1}{2}$	17.	21.	26.	30.	34.	39.	43.	47.	52.	56.	60.
2 $\frac{3}{4}$	23.	29.	34.	40.	46.	52.	58.	64.	69.	75.	81.
2 $\frac{7}{8}$	30.	37.	45.	52.	60.	67.	75.	82.	90.	97.	105.
3 $\frac{1}{8}$	38.	47.	57.	66.	76.	85.	95.	104.	114.	123.	133.
3 $\frac{1}{4}$	47.	59.	71.	83.	95.	107.	119.	131.	143.	155.	165.
3 $\frac{3}{8}$	58.	73.	88.	102.	117.	132.	146.	162.	176.	190.	205.
3 $\frac{1}{2}$	71.	89.	107.	125.	142.	160.	178.	196.	213.	231.	249.

HORSE POWER OF TURNED SHAFTING—(Kent)

As prime mover or head shaft carrying main driving pulley or gear, well supported by bearings

$$\text{Formula: H.P.} = \frac{D^3 \times R}{125}$$

DIAMETER OF SHAFT	NUMBER OF REVOLUTIONS PER MINUTE										
	60	80	100	125	150	175	200	225	250	275	300
1 $\frac{1}{8}$	2.6	3.4	4.3	5.4	6.4	7.5	8.6	9.7	10.7	11.8	12.9
1 $\frac{3}{8}$	3.8	5.1	6.4	8.	9.6	11.2	12.8	14.4	16.	17.6	19.2
2 $\frac{3}{8}$	5.4	7.3	8.1	10.	12.	14.	16.	18.	20.	22.	24.
2 $\frac{1}{2}$	7.5	10.	12.5	15.	18.	22.	25.	28.	31.	34.	37.
2 $\frac{3}{4}$	10.	13.	16.	20.	24.	28.	32.	36.	40.	44.	48.
2 $\frac{7}{8}$	13.	17.	20.	25.	30.	35.	40.	45.	50.	55.	60.
3 $\frac{1}{8}$	16.	22.	27.	34.	40.	47.	54.	61.	67.	74.	81.
3 $\frac{1}{4}$	20.	27.	34.	42.	51.	59.	68.	76.	85.	93.	102.
3 $\frac{3}{8}$	30.	41.	51.	64.	76.	89.	102.	115.	127.	140.	153.
4 $\frac{1}{8}$	43.	58.	72.	90.	108.	126.	144.	162.	180.	198.	216.
4 $\frac{3}{8}$	60.	80.	100.	125.	150.	175.	200.	225.	250.	275.	300.
5 $\frac{1}{8}$	80.	106.	133.	166.	199.	233.	266.	299.	333.	366.	400.

SPEED OF GRAIN ELEVATOR BELTS

Size of Head Pulley, Diameter, Inches	Speed of Belt, Feet per Minute	Revolutions per Minute of Head Shaft	Size of Head Pulley, Diameter, Inches	Speed of Belt, Feet per Minute	Revolutions per Minute of Head Shaft
24	250 to 300	40 to 48	54	425 to 450	30 to 32
30	300 to 350	38 to 44	60	475 to 500	30 to 32
36	350 to 375	37 to 40	72	575 to 600	30 to 32
42	375 to 400	34 to 36	84	625 to 650	28 to 30
48	400 to 425	32 to 34	..	.....	.....

WEIGHTS OF • AND ■ STEEL PER LINEAL FOOT

(Based on 489.6 lbs. per cubic foot)

Size, Inches	Wt. of • 1 ft. long	Wt. of ■ 1 ft. long	Size, Inches	Wt. of • 1 ft. long	Wt. of ■ 1 ft. long	Size, Inches	Wt. of • 1 ft. long	Wt. of ■ 1 ft. long	Size, Inches	Wt. of • 1 ft. long	Wt. of ■ 1 ft. long
0 1/32	.0026	.0033	1 1/4	8.178	10.41	3 1/2	32.71	41.65	5 1/2	73.60	93.72
0 1/16	.0104	.0133	1 1/2	8.773	11.17	3 3/4	33.90	43.14	5 3/4	75.37	95.96
0 1/8	.0417	.0531	1 3/4	9.388	11.95	3 5/8	35.09	44.68	5 7/8	77.15	98.23
0 1/4	.0938	.1195	1 7/8	10.02	12.76	3 3/4	36.31	46.24	5 7/8	78.95	100.5
0 3/8	.1669	.2123	2	10.68	13.60	3 5/4	37.56	47.82	5 7/8	80.77	102.8
0 1/2	.2608	.3333	2 1/8	11.36	14.46	3 1/2	38.81	49.43	5 7/8	82.62	105.2
0 5/8	.3756	.4782	2 1/4	12.06	15.35	3 3/4	40.10	51.05	5 7/8	84.49	107.6
0 3/4	.5111	.6508	2 3/8	12.78	16.27	3 1/2	41.40	52.71	5 7/8	86.38	110.0
0 7/8	.6676	.8500	2 1/2	13.52	17.22	4	42.73	54.40	5 7/8	88.29	112.4
0 9/8	.8449	1.076	2 3/4	14.28	18.19	4 1/4	44.07	56.11	5 7/8	90.22	114.9
0 5/8	1.043	1.328	2 5/8	15.07	19.18	4 1/2	45.44	57.85	5 7/8	92.17	117.4
0 1 1/8	1.262	1.608	2 7/8	15.86	20.20	4 3/4	46.83	59.62	5 7/8	94.14	119.9
0 1 1/4	1.502	1.913	2 3/4	16.69	21.25	4 1/2	48.24	61.41	6	96.14	122.4
0 1 1/2	1.763	2.245	2 1/2	17.53	22.33	4 3/4	49.66	63.23	6 1/8	98.14	125.0
0 1 3/4	2.044	2.603	2 1/4	18.40	23.43	4 3/4	51.11	65.08	6 1/8	100.2	127.6
0 1 7/8	2.347	2.989	2 1/4	19.29	24.56	4 1/2	52.58	66.95	6 1/8	102.2	130.2
1	2.670	3.400	2 3/4	20.20	25.00	4 1/2	54.07	68.85	6 1/4	104.3	132.8
1 1/8	3.014	3.838	2 1/2	21.12	26.90	4 1/2	55.59	70.78	6 1/4	106.4	135.5
1 1/4	3.379	4.303	2 1/2	22.07	28.10	4 1/2	57.12	72.73	6 1/4	108.5	138.2
1 1/4	3.766	4.795	2 1/2	23.04	29.34	4 1/2	58.67	74.70	6 1/4	110.7	140.9
1 1/4	4.173	5.312	3	24.03	30.60	4 3/4	60.25	76.71	6 1/4	112.8	143.6
1 1/4	4.600	5.857	3 1/4	25.04	31.89	4 3/4	61.84	78.74	6 1/4	114.9	146.5
1 3/8	5.019	6.428	3 1/4	26.08	33.20	4 3/4	63.46	80.81	6 1/4	117.2	149.2
1 3/8	5.518	7.026	3 1/4	27.13	34.55	4 3/4	65.10	82.89	6 1/4	119.4	152.1
1 3/8	6.008	7.650	3 1/4	28.20	35.92	5	66.76	85.00	6 1/4	121.7	154.9
1 3/8	6.520	8.301	3 1/4	29.30	37.31	5 1/8	68.44	87.14	6 1/4	123.9	157.8
1 3/8	7.051	8.978	3 1/4	30.42	38.73	5 1/8	70.14	89.30	6 1/4	126.2	160.8
1 3/8	7.604	9.682	3 1/4	31.56	40.18	5 1/8	71.86	91.49	6 1/4	128.5	163.6

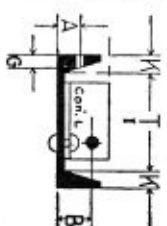
These figures represent the theoretical weights of steel. Iron will run about 2 per cent lighter.

WEIGHTS OF FLAT ROLLED STEEL, PER LINEAL FOOT

Thickness, Inches	WIDTH, INCHES															
	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	
1/16	.1060	.1381	.1594	.1859	.212	.2391	.2656	.292	.319	.372	.425	.478	.531	.584	.638	.744
1/8	.2125	.2656	.3188	.3720	.4250	.4782	.5312	.585	.638	.744	.850	.956	1.06	1.17	1.28	1.49
3/16	.319	.399	.478	.558	.638	.717	.797	.875	.956	1.15	1.28	1.44	1.59	1.75	1.91	2.23
1/4	.425	.531	.636	.743	.850	.957	1.06	1.17	1.28	1.49	1.70	1.92	2.12	2.34	2.55	2.98
5/16	.531	.664	.797	.929	1.06	1.20	1.33	1.46	1.59	1.86	2.12	2.39	2.65	2.92	3.19	3.72
3/8	.638	.797	.957	1.116	1.28	1.43	1.59	1.76	1.92	2.23	2.55	2.87	3.19	3.51	3.83	4.47
7/16	.744	.929	1.116	1.302	1.49	1.68	1.86	2.05	2.23	2.60	2.98	3.35	3.72	4.09	4.46	5.20
1/2	.850	1.06	1.275	1.487	1.70	1.92	2.12	2.34	2.55	2.98	3.40	3.83	4.25	4.67	5.10	5.95
5/8	.957	1.20	1.434	1.674	1.92	2.15	2.39	2.63	2.87	3.35	3.83	4.30	4.78	5.26	5.74	6.70
3/4	1.06	1.33	1.594	1.859	2.12	2.39	2.65	2.92	3.19	3.72	4.25	4.78	5.31	5.84	6.38	7.44
7/8	1.17	1.46	1.753	2.045	2.34	2.63	2.92	3.22	3.51	4.09	4.67	5.26	5.84	6.43	7.02	8.18
1	1.28	1.60	1.913	2.232	2.55	2.87	3.19	3.51	3.83	4.47	5.10	5.75	6.38	7.02	7.65	8.93
1 1/8	1.38	1.73	2.072	2.417	2.76	3.11	3.45	3.80	4.14	4.84	5.53	6.21	6.90	7.60	8.29	9.67
1 1/4	1.49	1.86	2.232	2.604	2.98	3.36	3.72	4.09	4.47	5.20	5.95	6.69	7.44	8.18	8.93	10.41
1 1/4	1.60	1.99	2.391	2.789	3.19	3.59	3.99	4.39	4.78	5.58	6.38	7.18	7.97	8.77	9.57	11.16
1 3/8	1.70	2.13	2.55	2.98	3.40	3.83	4.25	4.68	5.10	5.95	6.80	7.65	8.50	9.35	10.20	11.90
1 3/8	1.81	2.26	2.710	3.161	3.61	4.064	4.52	4.97	5.42	6.32	7.22	8.13	9.03	9.93	10.84	12.65
1 3/8	1.91	2.39	2.888	3.347	3.83	4.304	4.78	5.26	5.74	6.70	7.65	8.61	9.57	10.52	11.48	13.33
1 3/8	2.02	2.52	3.03	3.533	4.04	4.54	5.05	5.56	6.06	7.07	8.08	9.09	10.10	11.11	12.12	14.13
1 3/8	2.12	2.66	3.19	3.72	4.25	4.79	5.31	5.85	6.38	7.44	8.50	9.57	10.63	11.69	12.75	14.87
1 3/8	2.23	2.79	3.35	3.91	4.46	5.02	5.58	6.14	6.69	7.81	8.93	10.04	11.16	12.27	13.39	15.52
1 3/8	2.34	2.92	3.51	4.09	4.67	5.26	5.84	6.43	7.02	8.18	9.25	10.32	11.39	12.45	13.53	15.70
1 3/8	2.45	3.06	3.67	4.28	4.89	5.50	6.11	6.72	7.34	8.56	9.78	11.00	12.22	13.44	14.66	16.93
1 3/8	2.55	3.19	3.83	4.47	5.10	5.74	6.38	7.02	7.65	8.93	10.20	11.48	12.75	14.03	15.30	17.65
1 3/8	2.66	3.32	3.99	4.66	5.32	5.98	6.64	7.31	7.97	9.30	10.63	11.96	13.28	14.61	15.94	18.30
1 3/8	2.76	3.45	4.15	4.84	5.52	6.22	6.90	7.60	8.29	9.67	11.05	12.43	13.81	15.19	16.58	19.04
1 3/8	2.87	3.59	4.31	5.02	5.74	6.46	7.17	7.89	8.61	10.04	11.47	12.91	14.34	15.78	17.22	20.68
1 3/8	2.98	3.72	4.47	5.21	5.95	6.70	7.44	8.19	8.93	10.42	11.90	13.40	14.88	16.37	17.85	20.33
1 3/8	3.08	3.85	4.62	5.46	6.16	6.93	7.70	8.48	9.24	10.79	12.33	13.85	15.40	16.96	18.51	21.27
1 3/8	3.19	3.99	4.79	5.65	6.38	7.17	7.97	8.77	9.57	11.15	12.75	14.34	15.94	17.53	19.13	22.31
1 3/8	3.30	4.12	4.94	5.77	6.59	7.42	8.24	9.06	9.88	11.53	13.18	14.83	16.47	18.12	19.77	22.96
2	3.40	4.25	5.10	5.95	6.80	7.65	8.50	9.35	10.20	11.90	13.60	15.30	17.00	18.70	20.4	23.20

STANDARD STEEL
CHANNELS

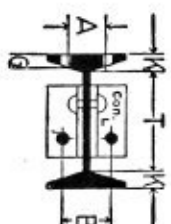
Weights and Dimensions



Size	Weight per Ft.	Width Flange	Area Sec. Torsion	Max. River Grip	Punch Gauge, Inches	K	T	Connection	L's
16	Lbs.	In.	In.	In.	Dia.	G	A	B	C
15	33.00	3.40	4.00	1.19	1/2	13	1 1/2	2 1/2	2 1/2
14	30.00	3.125	3.75	1.19	1/2	13	1 1/2	2 1/2	2 1/2
13	27.00	2.875	3.50	1.19	1/2	13	1 1/2	2 1/2	2 1/2
12	24.00	2.625	3.25	1.19	1/2	13	1 1/2	2 1/2	2 1/2
11	21.00	2.375	3.00	1.19	1/2	13	1 1/2	2 1/2	2 1/2
10	18.00	2.125	2.75	1.19	1/2	13	1 1/2	2 1/2	2 1/2
9	15.00	1.875	2.50	1.19	1/2	13	1 1/2	2 1/2	2 1/2
8	12.00	1.625	2.25	1.19	1/2	13	1 1/2	2 1/2	2 1/2
7	9.00	1.375	2.00	1.19	1/2	13	1 1/2	2 1/2	2 1/2
6	6.00	1.125	1.75	1.19	1/2	13	1 1/2	2 1/2	2 1/2
5	3.00	.875	1.50	1.19	1/2	13	1 1/2	2 1/2	2 1/2
4	1.50	.625	1.25	1.19	1/2	13	1 1/2	2 1/2	2 1/2
3	.75	.375	.75	1.19	1/2	13	1 1/2	2 1/2	2 1/2
2	.375	.1875	.375	1.19	1/2	13	1 1/2	2 1/2	2 1/2
1	.1875	.09375	.1875	1.19	1/2	13	1 1/2	2 1/2	2 1/2

STANDARD STEEL
"I" BEAMS

Weights and Dimensions



Size	Weight per Ft.	Width Flange	Area Sec. Torsion	Max. River Grip	Punch Gauge, Inches	K	T	Connection
16	Lbs.	In.	In.	In.	Dia.	G	A	B
15	33.00	3.40	4.00	1.19	1/2	13	1 1/2	2 1/2
14	30.00	3.125	3.75	1.19	1/2	13	1 1/2	2 1/2
13	27.00	2.875	3.50	1.19	1/2	13	1 1/2	2 1/2
12	24.00	2.625	3.25	1.19	1/2	13	1 1/2	2 1/2
11	21.00	2.375	3.00	1.19	1/2	13	1 1/2	2 1/2
10	18.00	2.125	2.75	1.19	1/2	13	1 1/2	2 1/2
9	15.00	1.875	2.50	1.19	1/2	13	1 1/2	2 1/2
8	12.00	1.625	2.25	1.19	1/2	13	1 1/2	2 1/2
7	9.00	1.375	2.00	1.19	1/2	13	1 1/2	2 1/2
6	6.00	1.125	1.75	1.19	1/2	13	1 1/2	2 1/2
5	3.00	.875	1.50	1.19	1/2	13	1 1/2	2 1/2
4	1.50	.625	1.25	1.19	1/2	13	1 1/2	2 1/2
3	.75	.375	.75	1.19	1/2	13	1 1/2	2 1/2
2	.375	.1875	.375	1.19	1/2	13	1 1/2	2 1/2
1	.1875	.09375	.1875	1.19	1/2	13	1 1/2	2 1/2

WEIGHTS AND DIMENSIONS STANDARD STEEL TEES

SIZE IN INCHES		THICKNESS OF METAL IN INCHES		Weight per Foot in Pounds	SIZE IN INCHES		THICKNESS OF METAL IN INCHES		Weight per Foot in Pounds	SIZE IN INCHES		THICKNESS OF METAL IN INCHES		Weight per Foot in Pounds
Flange	Stem	Flange	Stem		Flange	Stem	Flange	Stem		Flange	Stem	Flange	Stem	
4	4	1/2 to 3/8	1/2 to 3/8	13.90	3	3	5/16 to 3/8	5/16 to 3/8	6.80	1 1/4	1 1/4	1/4 to 3/8	1/4 to 3/8	3.20
4	4	3/8	3/8	10.90	2 1/2	2 1/2	3/8	3/8	6.50	1 1/2	1 1/2	1/4 to 3/8	1/4 to 3/8	2.60
3 1/2	3 1/2	1/2	1/2	11.90	2 1/2	2 1/2	3/8	3/8	5.60	1 1/2	1 1/2	3/8	3/8	2.00
3 1/2	3 1/2	3/8	3/8	9.30	2 1/4	2 1/4	3/8	3/8	5.00	1 1/4	1 1/4	1/4 to 3/8	1/4 to 3/8	2.10
3	3	1/2	1/2	10.90	2 1/4	2 1/4	1/4	1/4	4.20	1 1/4	1 1/4	3/8	3/8	1.70
3	3	1/2	1/2	9.00	2	2	3/8	3/8	4.40	1	1	3/8	3/8	1.30
3	3	3/8	3/8	7.90	2	2	1/4	1/4	3.70	1	1	1/8	1/8	1.00

WEIGHTS OF STEEL ANGLES

(With Fillet)

Per Lineal Foot in Pounds

SIZE IN INCHES	THICKNESS IN INCHES															
	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	
8 x 8	.....	.....	.....	.....	.....	.....	26.4	29.6	32.7	35.8	38.9	42.0	45.0	48.1	51.0
7 x 3 $\frac{1}{2}$	.....	.....	.....	.....	.....	15.0	17.0	19.1	21.0	23.0	24.9	26.8	28.7	30.5	32.3
6 x 6	.....	.....	.....	.....	14.9	17.2	19.6	21.9	24.2	26.5	28.7	31.0	33.1	35.3	37.5
6 x 4	.....	.....	.....	.....	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	28.9	30.6
6 x 3 $\frac{1}{2}$	.....	.....	.....	.....	11.7	13.5	15.3	17.1	18.9	20.6	22.4	24.0	25.7	27.3	28.9
5 x 5	.....	.....	.....	.....	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	28.9	30.6
5 x 4	.....	.....	.....	.....	11.0	12.8	14.5	16.2	17.8	19.5	21.1	22.7	24.2	.....	.....
5 x 3 $\frac{1}{2}$	.....	.....	.....	8.7	10.4	12.0	13.6	15.2	16.8	18.3	19.8	21.3	22.7	.....	.....
5 x 3	.....	.....	.....	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	.....	.....	.....
4 $\frac{1}{2}$ x 3	.....	.....	.....	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	18.5	.....	.....	.....
4 x 4	.....	5.2	6.6	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	.....	.....	.....
4 x 3 $\frac{1}{2}$	.....	.....	.....	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	.....	.....	.....	.....
4 x 3	.....	.....	.....	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	.....	.....	.....
3 $\frac{1}{2}$ x 3 $\frac{1}{2}$	.....	.....	5.8	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	.....	.....	.....
3 $\frac{1}{2}$ x 3	.....	.....	.....	6.6	7.9	9.1	10.2	11.4	12.5	13.6	14.7	1.58	.....	.....	.....
3 $\frac{1}{2}$ x 2 $\frac{1}{2}$	.....	.....	4.9	6.1	7.2	8.3	9.4	10.4	11.5	12.5	.....	.....	.....	.....	.....
3 $\frac{1}{4}$ x 3 $\frac{1}{2}$	.....	.....	.....	7.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3 $\frac{1}{4}$ x 2	.....	.....	4.3	5.3	6.3	7.2	8.1	9.0	.....	.....	.....	.....	.....	.....	.....
3 x 3	2.5	3.7	4.9	6.1	7.2	8.3	9.4	10.4	11.5	.....	.....	.....	.....	.....	.....
3 x 2 $\frac{1}{2}$	.....	3.4	4.5	5.6	6.6	7.6	8.5	9.5	.....	.....	.....	.....	.....	.....	.....
3 x 2	.....	3.1	4.1	5.0	5.9	6.8	7.7	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{3}{4}$ x 2 $\frac{1}{4}$	2.3	3.4	4.5	5.6	6.6	7.6	8.5	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{3}{4}$ x 2 $\frac{1}{2}$	2.1	3.1	4.1	5.0	5.9	6.8	7.7	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{1}{2}$ x 2	.....	2.8	3.7	4.5	5.3	6.1	6.8	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{1}{2}$ x 1 $\frac{3}{4}$	.....	2.6	3.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{1}{4}$ x 1 $\frac{1}{2}$	.....	2.4	3.2	3.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{1}{4}$ x 2 $\frac{1}{4}$	1.9	2.8	3.7	4.5	5.3	6.1	6.8	.....	.....	.....	.....	.....	.....	.....	.....
2 $\frac{1}{4}$ x 1 $\frac{1}{4}$	.....	2.3	3.0	3.7	4.4	5.0	5.6	.....	.....	.....	.....	.....	.....	.....	.....
2 x 2	1.7	2.5	3.2	4.0	4.7	5.3	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 x 1 $\frac{1}{2}$	.....	2.1	2.8	3.4	4.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 x 1 $\frac{1}{4}$	.....	2.1	2.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{3}{4}$ x 1 $\frac{3}{4}$	1.4	2.2	2.8	3.4	4.0	4.6	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	1.3	1.8	2.4	2.9	3.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{3}{8}$ x 1	1.0	.....	1.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{3}{8}$ x $\frac{7}{8}$	0.9	1.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{1}{4}$ x 1 $\frac{1}{4}$	1.1	1.48	2.0	2.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 $\frac{1}{8}$ x 1 $\frac{1}{8}$	0.9	1.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 x 1	0.8	1.2	1.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 x $\frac{3}{4}$	0.7	1.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 x $\frac{5}{8}$	0.6	0.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{7}{8}$ x $\frac{7}{8}$	0.7	1.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{3}{4}$ x $\frac{3}{4}$	0.6	0.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{5}{8}$ x $\frac{5}{8}$	0.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

STRENGTH OF BOLTS, STAYS AND SUSPENSION RODS

U. S. Standard—At Reduced Area

Diam. of Bolt	Area of Bolt	Diam. at Root of Thread	Reduced Area	No. of Thread Per Inch	TENSILE STRENGTH PER SQUARE INCH						
					6,000 lbs.	7,000 lbs.	7,500 lbs.	8,000 lbs.	9,000 lbs.	10,000 lbs.	12,000 lbs.
1/4	.04909	.185	.0269	20	161	188	201	215	242	269	322
5/16	.0767	.240	.0452	18	271	316	339	361	406	452	542
3/8	.11045	.294	.0678	16	406	474	478	542	610	678	813
1/2	.15033	.344	.0930	14	558	651	697	744	837	930	1,116
5/8	.19635	.400	.1257	13	754	879	943	1,005	1,131	1,257	1,508
3/4	.2485	.454	.1619	12	971	1,133	1,214	1,295	1,457	1,619	1,942
7/8	.30679	.507	.2019	11	1,211	1,413	1,514	1,615	1,817	2,019	2,422
1	.44178	.620	.3019	10	1,811	2,113	2,384	2,415	2,717	3,019	3,622
1 1/8	.60132	.731	.4197	9	2,518	2,937	3,147	3,357	3,777	4,197	5,036
1 1/4	.7854	.837	.5502	8	3,301	3,851	4,126	4,401	4,951	5,502	6,602
1 1/2	.99402	.940	.6940	7	4,164	4,858	5,205	5,552	6,246	6,940	8,328
1 3/4	1.2271	1.065	.8908	7	5,344	6,235	6,681	7,126	8,017	8,908	10,689
1 7/8	1.4848	1.160	1.0568	6	6,340	7,397	7,926	8,454	9,511	10,568	12,681
2	1.7671	1.284	1.2950	6	7,770	9,065	9,712	10,360	11,655	12,950	15,540
2 1/8	2.0739	1.389	1.5152	5 1/2	9,091	10,696	11,364	12,121	13,636	15,152	18,182
2 1/4	2.4052	1.491	1.7460	5	10,476	12,222	13,095	13,968	15,714	17,460	20,952
2 1/2	2.7611	1.616	2.0510	5	12,396	14,357	15,380	16,408	18,459	20,510	24,612
2 3/4	3.1416	1.712	2.3020	4 1/2	13,812	16,114	17,265	18,416	20,718	23,020	27,624
3	3.976	1.962	3.0235	4 1/2	18,141	21,164	22,676	24,188	27,211	30,235	36,282
3 1/8	4.9087	2.176	3.7187	4	22,312	26,030	27,890	29,749	33,468	37,187	44,624
3 1/4	5.9395	2.426	4.6225	4	27,735	32,357	34,668	36,980	41,602	46,225	55,470
3 1/2	7.0686	2.629	5.4284	3 1/2	32,570	37,998	40,713	43,427	48,855	54,284	65,140
3 3/4	8.2957	2.879	6.5099	3 1/2	39,059	45,569	48,824	52,079	58,589	65,099	78,118
3 7/8	9.6211	3.100	7.5477	3 1/4	45,286	52,833	56,607	60,381	67,929	75,477	90,572
4	11.0446	3.317	8.6413	3	51,847	60,489	64,809	69,130	77,771	86,413	103,695
4 1/8	12.5664	3.567	9.9930	3	59,958	69,957	74,947	79,944	89,937	99,930	119,916
4 1/4	14.1862	3.798	11.3292	2 3/4	67,975	79,304	84,969	90,633	101,963	113,292	135,950
4 1/2	15.9043	4.028	12.7429	2 3/4	76,457	89,200	95,571	101,943	114,686	127,429	152,914

SHEARING AND BEARING VALUE OF RIVETS

DIAMETER-RIVET			ALL DIMENSIONS IN INCHES.													
Frac.	Inches	Area Sq. In.	Single Shear in Pounds	Bearing value in pounds per square inch for different thickness plate												
				1-4	5-16	3-8	7-16	1-2	9-16	5-8	11-16	3-4	13-16	7-8	15-16	1 in.
3/8	.375	.1104	660	1130	1410	1690	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1/2	.50	.1963	1180	1500	1880	2550	2630	3000	.....	.....	.....	.....	.....	.....	.....	.....
5/8	.625	.3063	6000	1880	2340	2810	3280	3750	4220	4690	.....	.....	.....	.....	.....	.....
3/4	.75	.4418	lbs.	2250	2810	3380	3940	4500	5060	5630	6190	6750	.....	.....	.....	.....
7/8	.875	.6013	lbs.	2630	3280	3940	4590	5250	5910	6560	7220	7880	8530	9190	9840	.....
1 in.	1.00	.7854	4710	3000	3750	4500	5250	6000	6750	7500	8250	9000	9750	10500	12250	12000
3/8	.375	.1104	830	1410	1760	2110	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1/2	.50	.1963	1470	1880	2340	2810	3280	3750	.....	.....	.....	.....	.....	.....	.....	.....
5/8	.625	.3063	7500	2340	2930	3520	4100	4690	5280	5860	.....	.....	.....	.....	.....	.....
3/4	.75	.4418	lbs.	2810	3520	4220	4920	5630	6330	7030	7720	8440	10670	.....	.....	.....
7/8	.875	.6013	4510	3280	4100	4920	5740	6560	7380	8200	9030	9850	10670	11480	12300	.....
1 in.	1.00	.7854	5890	3750	4690	5620	6560	7500	8440	9380	10310	11250	12190	13130	14060	15000
3/8	.375	.1104	1100	1880	2340	2810	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1/2	.50	.1963	1960	2500	3130	3750	4380	5000	.....	.....	.....	.....	.....	.....	.....	.....
5/8	.625	.3063	10000	3130	3910	4690	5470	6250	7030	7810	.....	.....	.....	.....	.....	.....
3/4	.75	.4418	lbs.	3750	4690	5630	6560	7500	8440	9380	10310	11250	.....	.....	.....	.....
7/8	.875	.6013	6010	4380	5470	6570	7660	8750	9840	10940	12030	13130	14220	15310	16410	.....
1 in.	1.00	.7854	7850	5000	6250	7500	8750	10000	11250	12500	13750	15000	16250	17500	18750	20000
3/8	.375	.1104	1320	2350	2930	3520	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1/2	.50	.1963	2360	3130	3910	4690	5470	6250	.....	.....	.....	.....	.....	.....	.....	.....
5/8	.625	.3063	12000	3910	4880	5860	6840	7810	8790	9770	.....	.....	.....	.....	.....	.....
3/4	.75	.4418	lbs.	4690	5860	7030	8210	9380	10550	11720	12890	14060	.....	.....	.....	.....
7/8	.875	.6013	7220	5470	6840	8210	9580	10940	12310	13670	15040	16410	17770	19140	20510	.....
1 in.	1.00	.7854	9430	6250	7820	9380	10940	12500	14060	15630	17190	18750	20320	21880	23440	25000

UNITED STATES STANDARD BOLTS AND NUTS

Dimensions, Etc.

Diameter of Bolt, Inches	Area at Bottom of Thread	Tensile Strength at 10,000 Pounds per Square Inch	Threads per Inch	Thickness of Head	Thickness of Nut	Short Diameter Square or Hexagon Head or Nut	Long Diameter Square Head or Nut	Long Diameter Hexagon Head or Nut	Weight Each Square Nut	Weight Each Hexagon Nut	Weight per 100 Square Nuts	Weight per 100 Hexagon Nuts	Weight per Inch Length of Bolt
1/4	.0269	269	20	1/4	1/4	1/2	1 1/8	1 1/8	.0138	.0131	1.38	1.31	.0136
5/16	.0454	454	18	5/16	5/16	3/4	1 1/4	1 1/4	.0231	.0192	2.31	1.92	.0213
3/8	.0678	678	16	3/8	3/8	7/8	1 1/2	1 1/2	.0426	.0333	4.26	3.33	.0396
7/16	.0933	933	14	7/16	7/16	1	1 3/4	1 3/4	.0613	.0500	6.13	5.00	.0417
1/2	.1257	1,257	13	1/2	1/2	1 1/8	2	2	.0893	.0700	8.93	7.00	.0545
5/8	.2018	2,018	11	5/8	5/8	1 1/4	2 1/4	2 1/4	.1560	.1350	15.60	13.50	.0852
3/4	.3020	3,020	10	3/4	3/4	1 1/2	2 3/4	2 3/4	.2630	.2220	26.30	22.20	.1227
7/8	.4193	4,193	9	7/8	7/8	1 3/4	3 1/4	3 1/4	.3570	.3240	35.70	32.40	.1670
1	.5510	5,510	8	1	1	2	3 3/4	3 3/4	.5880	.4630	58.80	46.30	.2181
1 1/8	.6931	6,931	7	1 1/8	1 1/8	2 1/4	4 1/4	4 1/4	.7690	.6760	76.90	67.60	.2760
1 1/4	.8899	8,899	7	1 1/4	1 1/4	2 3/4	4 3/4	4 3/4	1.04	.9010	104.	90.10	.3410
1 3/8	1.0541	10,541	6	1 3/8	1 3/8	3	5 1/4	5 1/4	1.43	1.18	143.	118.	.4120
1 1/2	1.2938	12,938	6	1 1/2	1 1/2	3 1/4	5 3/4	5 3/4	1.72	1.47	172.	147.	.4900
1 3/4	1.7441	17,441	5	1 3/4	1 3/4	3 3/4	6 3/4	6 3/4	2.94	2.50	294.	250.	.6680
2	2.3001	23,001	4 1/2	2	2	4	7 1/2	7 1/2	4.35	3.45	435.	345.	.8720

WEIGHTS OF SQUARE HEAD MACHINE BOLTS—Per 100

DIAMETER	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Length											
1 1/2	3.5	6.3	9.3	14.1	20.	28.	35.	52	82	...	...
2	4.1	7.3	10.8	16.3	22.7	31.	38.5	57	91	...	...
2 1/2	4.8	8.3	12.3	18.3	25.3	34.3	42.6	63	100	141	204
3	5.3	9.3	13.7	20.4	28.	38.5	46.8	69	108	152	218
3 1/2	5.9	10.3	15.1	22.4	30.6	42.8	50.9	76	116	163	232
4	6.8	11.3	16.6	24.5	33.3	46.	55.	83	125	174	246
4 1/2	7.3	12.3	18.	26.5	35.9	49.3	59.	90	133	185	260
5	8.	13.4	19.5	28.6	38.6	52.5	63.3	97	142	196	274
5 1/2	8.6	14.5	21.	30.6	41.3	56.8	67.5	103	151	206	288
6	9.3	15.6	22.4	32.7	43.9	60.	71.8	109	159	216	302
6 1/2	9.9	16.7	23.9	34.7	46.5	63.3	75.9	115	168	230	316
7	10.5	17.8	25.5	36.8	49.2	66.5	79.	121	176	244	330
7 1/2	11.2	18.9	27.2	38.8	51.8	69.8	83.	127	184	253	344
8	11.9	20.	28.7	40.9	54.5	73.	92.	139	202	271	372
9	...	...	31.7	45.	59.8	80.5	100.	151	219	280	400
10	...	...	34.7	49.1	65.1	87.	105.	157	227	298	414
12	...	...	40.7	57.3	75.7	98.8	120.	181	261	340	470
14	...	...	...	...	86.3	111.	138.	205	295	383	526
16	...	...	...	...	96.9	127.	156.	229	329	426	577
18	...	...	...	...	107.5	140.	172.	254	363	470	635
20	...	...	...	...	118.1	154.	188.	279	397	513	692

WEIGHTS OF CARRIAGE BOLTS—PER 100

DIAMETER	1/4	5/16	3/8	7/16	1/2	5/8
Length	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1 1/2	3.4	6.2	9.	13.1	17.8	...
2	4.	7.2	10.4	15.1	20.	37.2
2 1/2	4.6	8.2	11.9	17.1	22.5	41.1
3	5.2	9.2	13.3	19.1	25.1	45.1
3 1/2	5.7	10.1	14.8	21.1	27.6	49.1
4	6.6	11.2	16.2	23.1	30.2	53.
4 1/2	7.2	12.3	17.6	25.1	32.7	57.
5	7.9	13.2	19.1	27.1	35.3	61.
5 1/2	8.5	14.2	20.6	29.1	37.8	65.1
6	9.1	15.3	22.1	31.2	40.4	69.2
6 1/2	9.7	16.4	23.6	33.1	43.	73.2
7	10.3	17.5	25.1	35.2	45.6	77.2
7 1/2	...	18.5	26.6	37.2	48.2	81.3
8	...	19.5	28.1	39.3	50.8	85.3
9	...	...	31.1	43.2	56.	93.3
10	...	...	34.1	47.4	61.2	101.3

WEIGHTS OF COACH AND LAG SCREWS—PER 100

DIAMETER	5/16	3/8	7/16	1/2	5/8	3/4
Length	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1 1/2	3.5	5.8	9.1	...	...	...
2	4.4	7.1	11.	15.	26.3	...
2 1/2	5.3	8.5	12.9	17.3	29.9	...
3	6.2	9.8	14.8	19.5	33.5	46.1
3 1/2	7.1	11.1	16.5	21.6	37.1	51.5
4	8.	12.5	18.2	23.8	40.7	57.1
4 1/2	9.	13.8	19.9	26.3	44.5	62.9
5	10.	14.9	21.8	28.8	48.3	68.8
5 1/2	11.	16.	23.5	31.3	52.	74.7
6	12.	17.2	25.2	33.8	55.7	80.5
7	...	...	...	38.9	63.2	92.3
8	...	...	...	44.	69.3	104.
9	...	...	...	48.5	76.4	115.4
10	...	...	...	53.	83.5	126.8
11	...	...	...	57.5	90.6	138.2
12	...	...	...	62.	97.8	149.5

USEFUL INFORMATION.

DIFFERENT STANDARDS FOR WIRE GAUGE IN USE IN THE UNITED STATES.

Dimensions of Sizes in Decimal Parts of an Inch.

Number of Wire Gauge.	American or Brown & Sharpe.	Birmingham or Stubbs Wire.	Washburn & Moen Mfr. Co. Wires.	Imperial Wire Gauge.	Stubbs' Steel Wire.	U. S. Standard for Plate.
000000				.464		.46875
00000				.432		.4375
0000	.46	.454	.3938	.400		.40625
000	.40964	.425	.3625	.372		.375
00	.3648	.38	.3310	.348		.34375
0	.32486	.34	.3065	.324		.3125
1	.2893	.3	.2830	.300	.227	.28125
2	.25763	.284	.2625	.276	.219	.265625
3	.22942	.259	.2437	.252	.212	.25
4	.20431	.238	.2253	.232	.207	.234375
5	.18194	.22	.2070	.212	.204	.21875
6	.16203	.203	.1920	.192	.201	.203125
7	.14428	.18	.1770	.176	.199	.1875
8	.12849	.165	.1620	.160	.197	.171875
9	.11443	.148	.1483	.144	.194	.15625
10	.10189	.134	.1350	.128	.191	.140625
11	.090742	.12	.1205	.116	.188	.125
12	.080808	.109	.1055	.104	.185	.109375
13	.071961	.095	.0915	.092	.182	.09375
14	.064084	.083	.0800	.080	.180	.078125
15	.057068	.072	.0720	.072	.178	.0703125
16	.05082	.065	.0625	.064	.175	.0625
17	.045257	.058	.0540	.056	.172	.05625
18	.040303	.049	.0475	.048	.168	.05
19	.03589	.042	.0410	.040	.164	.04375
20	.031961	.035	.0348	.036	.161	.0375
21	.028462	.032	.03175	.032	.157	.034375
22	.025347	.028	.0286	.028	.155	.03125
23	.022571	.025	.0258	.024	.153	.028125
24	.0201	.022	.0230	.022	.151	.025
25	.0179	.02	.0204	.020	.148	.021875
26	.01594	.018	.0181	.018	.146	.01875
27	.014195	.016	.0173	.0164	.143	.0171875
28	.012641	.014	.0162	.0149	.139	.015625
29	.011257	.013	.0150	.0136	.134	.0140625
30	.010025	.012	.0140	.0124	.127	.0125
31	.008928	.01	.0132	.0116	.120	.0109375
32	.00795	.009	.0128	.0108	.115	.01015625
33	.00708	.008	.0118	.0100	.112	.009375
34	.006304	.007	.0104	.0092	.110	.00859375
35	.005614	.005	.0095	.0084	.108	.0078125
36	.005	.004	.0090	.0076	.106	.00703125
37	.004453			.0068	.103	.00640625
38	.003955			.0062	.101	.00625
39	.003531			.0059		
40	.003144			.0048	.097	

WEIGHTS PER SQUARE FOOT OF SHEET WROUGHT IRON, STEEL, COPPER, AND BRASS.

For Thickness by American (Brown & Sharpe's) Gauge.

No. of Gauge.	Thickness in inches.	Iron.	Steel.	Copper.	Brass.
0000	.46	18.46	18.70	20.84	19.69
000	.4096	16.44	16.66	18.56	17.53
00	.3648	14.64	14.83	16.53	15.61
0	.3249	13.04	13.21	14.72	13.90
1	.2893	11.61	11.76	13.11	12.38
2	.2576	10.34	10.48	11.67	11.03
3	.2294	9.21	9.33	10.39	9.82
4	.2043	8.20	8.31	9.26	8.74
5	.1819	7.30	7.40	8.24	7.79
6	.1620	6.50	6.59	7.34	6.93
7	.1443	5.79	5.87	6.54	6.18
8	.1285	5.16	5.22	5.82	5.50
9	.1144	4.59	4.65	5.18	4.90
10	.1019	4.09	4.14	4.62	4.36
11	.0907	3.64	3.69	4.11	3.88
12	.0808	3.24	3.29	3.66	3.46
13	.0720	2.89	2.93	3.26	3.08
14	.0641	2.57	2.61	2.90	2.74
15	.0571	2.29	2.32	2.59	2.48
16	.0508	2.04	2.07	2.35	2.24
17	.0453	1.82	1.84	2.05	1.94
18	.0403	1.62	1.64	1.83	1.73
19	.0359	1.44	1.46	1.63	1.54
20	.0320	1.28	1.30	1.45	1.37
21	.0285	1.14	1.16	1.29	1.22
22	.0253	1.02	1.03	1.15	1.08
23	.0225	.906	.918	1.02	.966
24	.0201	.807	.817	.911	.860
25	.0179	.728	.738	.811	.766
26	.0159	.640	.648	.722	.682
27	.0142	.570	.577	.643	.608
28	.0126	.507	.514	.573	.541
29	.0113	.452	.458	.510	.482
30	.0100	.402	.408	.454	.429
31	.0089	.358	.363	.404	.382
32	.0080	.319	.323	.360	.340
33	.0071	.284	.288	.321	.303
34	.0063	.253	.256	.286	.270
35	.0056	.225	.228	.254	.240
Specific gravity.....		7.704	7.806	8.698	8.218
Weight per cubic inch.....		.2787	.2823	.3146	.2972
Weight per cubic foot.....		481.25	487.75	543.60	513.60

TABLE SHOWING THE NUMBER OF FEET, BOARD MEASURE, CONTAINED IN A PIECE OF JOIST, SCANTLING, OR TIMBER OF THE SIZES GIVEN.

Size in inches.	LENGTH IN FEET OF JOISTS, SCANTLING AND TIMBER.															Size in inches.	LENGTH IN FEET OF JOISTS, SCANTLING AND TIMBER.												
	12	14	16	18	20	22	24	26	28	30	42	44	45				12	14	16	18	20	22	24	26	28	30	42	44	45
2x 4	8	9	11	12	13	15	16	17	19	20	28	29	30	4x12	48	56	64	72	80	88	96	104	112	120	168	176	180		
2x 6	12	14	16	18	20	22	24	26	28	30	42	44	45	6x 6	36	42	48	54	60	66	72	78	84	90	126	132	130		
2x 8	16	19	21	24	27	29	32	35	37	40	53	58	60	6x 8	48	56	64	72	80	88	96	104	112	120	168	176	180		
2x10	20	23	27	30	33	37	40	43	47	50	70	74	75	6x10	60	70	80	90	100	110	120	130	140	150	210	220	225		
2x12	24	28	32	36	40	44	48	52	56	60	84	88	90	6x12	72	84	96	108	120	132	144	156	168	180	250	260	270		
3x 4	12	14	16	18	20	22	24	26	28	30	42	44	45	8x 8	64	75	85	95	107	117	128	139	149	160	224	234	240		
3x 6	16	21	24	27	30	33	36	39	42	45	63	66	68	8x10	80	97	112	126	140	154	168	182	196	210	280	294	300		
3x 8	24	28	32	36	40	44	48	52	56	60	84	88	90	8x12	96	112	128	144	160	176	192	208	224	240	336	352	360		
3x10	30	35	40	45	50	55	60	65	70	75	105	110	113	10x10	100	117	133	150	167	183	200	217	233	250	350	366	375		
3x12	36	42	48	54	60	66	72	78	84	90	126	132	135	10x12	120	140	160	180	200	220	240	260	280	300	420	440	450		
4x 4	16	19	21	24	27	29	32	35	37	40	56	58	60	12x12	144	168	192	216	240	264	288	312	336	360	504	528	540		
4x 6	24	28	32	36	40	44	48	52	56	60	84	88	90	12x14	168	196	224	252	280	308	336	364	392	420	588	616	630		
4x 8	32	37	43	48	53	59	64	69	75	80	112	118	120	14x14	196	229	261	294	327	359	392	425	457	490	686	716	735		
4x10	40	47	53	60	67	73	80	87	93	100	140	146	150																

RULE FOR FINDING THE WEIGHT OF CASTINGS OR FORGINGS BY THE WEIGHT OF THEIR PATTERNS.

Multiply the weight of the white paint pattern by 16 for cast iron; 17.1 for wrought iron; 17.3 for steel; 18 for copper; 25 for lead; 12.2 for tin; 13 for brass; 11.4 for zinc, and the product is the weight of the casting

NUMBER OF GALLONS IN ROUND CISTERNS AND TANKS

DIAMETER IN FEET

Depth in Feet	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	25
5	7.25	1.060	1.440	1.825	2.210	2.595	2.980	3.365	3.750	4.135	4.520	4.905	5.290	5.675	6.060	6.445	6.830	7.215
6	8.81	1.270	1.745	2.220	2.695	3.170	3.645	4.120	4.595	5.070	5.545	6.020	6.495	6.970	7.445	7.920	8.395	8.870
7	1.028	1.480	2.035	2.590	3.145	3.700	4.255	4.810	5.365	5.920	6.475	7.030	7.585	8.140	8.695	9.250	9.805	10.360
8	1.176	1.690	2.320	2.950	3.580	4.210	4.840	5.470	6.100	6.730	7.360	7.990	8.620	9.250	9.880	10.510	11.140	11.770
9	1.324	1.900	2.605	3.310	4.015	4.720	5.425	6.130	6.835	7.540	8.245	8.950	9.655	10.360	11.065	11.770	12.475	13.180
10	1.472	2.110	2.880	3.650	4.420	5.190	5.960	6.730	7.500	8.270	9.040	9.810	10.580	11.350	12.120	12.890	13.660	14.430
11	1.620	2.320	3.150	3.980	4.810	5.640	6.470	7.300	8.130	8.960	9.790	10.620	11.450	12.280	13.110	13.940	14.770	15.600
12	1.768	2.520	3.400	4.230	5.060	5.890	6.720	7.550	8.380	9.210	10.040	10.870	11.700	12.530	13.360	14.190	15.020	15.850
13	1.916	2.720	3.650	4.480	5.310	6.140	6.970	7.800	8.630	9.460	10.290	11.120	11.950	12.780	13.610	14.440	15.270	16.100
14	2.064	2.920	3.900	4.730	5.560	6.390	7.220	8.050	8.880	9.710	10.540	11.370	12.200	13.030	13.860	14.690	15.520	16.350
15	2.212	3.120	4.150	4.980	5.810	6.640	7.470	8.300	9.130	9.960	10.790	11.620	12.450	13.280	14.110	14.940	15.770	16.600
16	2.360	3.320	4.400	5.230	6.060	6.890	7.720	8.550	9.380	10.210	11.040	11.870	12.700	13.530	14.360	15.190	16.020	16.850
17	2.508	3.520	4.650	5.480	6.310	7.140	7.970	8.800	9.630	10.460	11.290	12.120	12.950	13.780	14.610	15.440	16.270	17.100
18	2.656	3.670	4.850	5.680	6.510	7.340	8.170	9.000	9.830	10.660	11.490	12.320	13.150	13.980	14.810	15.640	16.470	17.300
19	2.804	3.820	5.050	5.880	6.710	7.540	8.370	9.200	10.030	10.860	11.690	12.520	13.350	14.180	15.010	15.840	16.670	17.500
20	2.952	3.970	5.250	6.080	6.910	7.740	8.570	9.400	10.230	11.060	11.890	12.720	13.550	14.380	15.210	16.040	16.870	17.700

For tanks that are tapering, measure the diameter four-tenths from the large end.

NUMBER OF U. S. GALLONS IN RECTANGULAR TANKS

For One Foot in Depth

LENGTH OF TANK

Width of Tank	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.	ft.	ft. in.
2 ft.	29.52	27.40	44.88	52.36	59.84	67.32	74.80	82.28	89.76	97.24	104.72	112.20	119.68	127.16	134.64	142.12	149.60	157.08
2 6 in.	46.75	44.10	65.15	75.23	85.31	95.39	105.47	115.55	125.63	135.71	145.79	155.87	165.95	176.03	186.11	196.19	206.27	216.35
3 ft.	67.32	63.15	91.64	107.04	122.44	137.84	153.24	168.64	184.04	199.44	214.84	230.24	245.64	261.04	276.44	291.84	307.24	322.64
3 6 in.	82.28	77.10	109.39	127.47	145.55	163.63	181.71	199.79	217.87	235.95	254.03	272.11	290.19	308.27	326.35	344.43	362.51	380.59
4 ft.	103.84	97.15	138.88	160.32	181.76	203.20	224.64	246.08	267.52	288.96	310.40	331.84	353.28	374.72	396.16	417.60	439.04	460.48
4 6 in.	124.80	117.10	161.12	185.52	209.92	234.32	258.72	283.12	307.52	331.92	356.32	380.72	405.12	429.52	453.92	478.32	502.72	527.12
5 ft.	145.76	137.05	186.40	213.76	241.12	268.48	295.84	323.20	350.56	377.92	405.28	432.64	460.00	487.36	514.72	542.08	569.44	596.80
5 6 in.	166.72	156.95	212.88	243.52	274.16	304.80	335.44	366.08	396.72	427.36	458.00	488.64	519.28	549.92	580.56	611.20	641.84	672.48
6 ft.	187.68	176.85	238.40	272.64	306.88	341.12	375.36	409.60	443.84	478.08	512.32	546.56	580.80	615.04	649.28	683.52	717.76	752.00
6 6 in.	208.64	196.75	263.68	301.92	340.16	378.40	416.64	454.88	493.12	531.36	569.60	607.84	646.08	684.32	722.56	760.80	799.04	837.28
7 ft.	229.60	216.65	286.88	329.12	371.36	413.60	455.84	498.08	540.32	582.56	624.80	667.04	709.28	751.52	793.76	836.00	878.24	920.48
7 6 in.	250.56	236.60	312.88	359.12	405.36	451.60	497.84	544.08	590.32	636.56	682.80	729.04	775.28	821.52	867.76	914.00	960.24	1006.48
8 ft.	271.52	256.55	340.16	390.40	440.64	490.88	541.12	591.36	641.60	691.84	742.08	792.32	842.56	892.80	943.04	993.28	1043.52	1093.76
8 6 in.	292.48	276.45	368.80	422.08	475.36	528.64	581.92	635.20	688.48	741.76	795.04	848.32	901.60	954.88	1008.16	1061.44	1114.72	1168.00
9 ft.	313.44	296.35	399.36	456.64	513.92	571.20	628.48	685.76	743.04	800.32	857.60	914.88	972.16	1029.44	1086.72	1144.00	1201.28	1258.56
9 6 in.	334.40	316.25	425.20	485.52	545.84	606.16	666.48	726.80	787.12	847.44	907.76	968.08	1028.40	1088.72	1149.04	1209.36	1269.68	1329.99
10 ft.	355.36	336.15	452.80	516.08	579.36	642.64	705.92	769.20	832.48	895.76	959.04	1022.32	1085.60	1148.88	1212.16	1275.44	1338.72	1402.00
10 6 in.	376.32	355.95	480.16	547.44	614.72	682.00	749.28	816.56	883.84	951.12	1018.40	1085.68	1152.96	1220.24	1287.52	1354.80	1422.08	1489.36
11 ft.	397.28	375.85	501.12	572.40	643.68	714.96	786.24	857.52	928.80	999.08	1069.36	1139.64	1209.92	1280.20	1350.48	1420.76	1491.04	1561.32
11 6 in.	418.24	395.75	522.08	597.36	668.64	739.92	811.20	882.48	953.76	1025.04	1096.32	1167.60	1238.88	1310.16	1381.44	1452.72	1524.00	1595.28
12 ft.	439.20	415.65	543.04	622.32	703.60	784.88	866.16	947.44	1028.72	1109.00	1189.28	1269.56	1349.84	1430.12	1510.40	1590.68	1670.96	1751.24

USEFUL INFORMATION.

SQUARE OR LAND MEASURE.

United States and British.

Square Miles.	Acres.	Square Rods.	Square Yards.	Square Feet.	Square Inches.
1	640.	102400.	3097600.	27878400.	6272640.
....	1.	160.	4840.	43560.	39204.
....	....	1.	30.25	272.25	1296.
....	....	0.0331	1.	9.0	144.
....	....	....	0.111	1.	144.
....	....	....	....	0.00694	1.

Acres \times .0015625 = square miles.

Square yards \times .00000325 = square miles.

Acres \times .4840 = square yards.

Square yards \times .0002066 = acres.

A section of land is 1 mile square and contains 640 acres.

A square acre is 208.71 feet at each side, or 220 \times 198 feet.

A square $\frac{1}{2}$ acre is 147.58 feet at each side, or 110 \times 198 feet.

A square $\frac{1}{4}$ acre is 104.355 feet at each side, or 55 \times 198 feet.

A circular acre is 235.504 feet in diameter.

A circular $\frac{1}{2}$ acre is 166.527 feet in diameter.

A circular $\frac{1}{4}$ acre is 117.752 feet in diameter.

CUBIC OR SOLID MEASURE.

United States and British.

1728 cubic inches = 1 cubic foot.

27 cubic feet = 1 cubic yard.

A cord of wood = 4' \times 4' \times 8' = 128 cubic feet.

A perch of masonry = 16.5' \times 1.5' \times 1' = 24.75 cubic feet, but is generally assumed at 25 cubic feet.

LIQUID MEASURE.

This measure is founded upon the old British wine gallon, which contained 231 cubic inches of distilled water at a temperature of 39.85° Fahrenheit, the barometer standing at 30 inches.

4 gills = 1 pint. 2 barrels = 1 hogshead.

2 pints = 1 quart. 2 hogsheads = 1 pipe, or butt.

4 quarts = 1 gallon. 2 pipes = 1 tun.

31 $\frac{1}{2}$ gallons = 1 barrel.

A puncheon is 84 gallons.

A tierce is 42 gallons.

NAUTICAL MEASURE.

A nautical or sea mile (a knot) is the length of a minute of longitude of the earth at the equator at the level of the sea. It is assumed = 6086.07 feet = 1.152664 statute or land miles by the United States coast survey.

3 nautical miles = 1 league.

DRY MEASURE.

United States Only.

Struck Bushel.	Pecks.	Quarts.	Pints.	Gallons.	Cubic Inches.
1	4	32.	64	8.	2150.
..	1	8.	16	2.	537.6
..	..	1.	2	0.25	67.2
..	..	0.5	1	0.125	33.6
..	..	4.	8	1.	268.8

A gallon of liquid measure = 231 cubic inches.

A heaped bushel = 1 $\frac{1}{4}$ struck bushels. The cone in a heaped bushel must not be less than 6 inches high.

A barrel of U. S. hydraulic cement = 300 to 310 lbs., usually, and of genuine Portland cement = 425 lbs.

To reduce U. S. dry measures to British imperial of the same name, divide by 1.032.

THE SIZE OF BOLT HEADS, NUTS AND WASHERS.

Diameter of bolt = 1.

Diameter of the head and nut, square or hexagon, = 1 $\frac{1}{4}$ from side to side.

Diameter of head and nut, hexagon = 2 over the angles.

Thickness of head = $\frac{1}{4}$ of diameter of bolt.

Thickness of nut = 1 $\frac{1}{2}$ of diameter of bolt.

Washers should equal half the thickness of the head, and have twice the area.

Approximately—The weight of a hexagon head and square nut together will equal a rod of iron in length five times the diameter of the bolt;

For square heads and nuts, six times the diameter;

And for rose heads and square nuts, four times the diameter.

RIVETS.

Diameter of rivet for plates less than $\frac{1}{2}$ inch thick = twice the thickness of the plate.

Diameter of rivets for plates $\frac{1}{2}$ inch thick and upwards = once and a half the thickness of the plate.

Length of rivet measured before clinching = the thickness of the plate + 2 $\frac{1}{2}$ times the diameter of the rivet.

SHRINKAGE OF CASTINGS

In locomotive cylinders is $\frac{1}{8}$ inch in a foot.

Pipes is $\frac{1}{4}$ inch in a foot.

Girders, beams, etc., is $\frac{1}{8}$ inch in 15 inches.

Engine beams, connecting rods, etc., is $\frac{1}{8}$ inch in 16 inches.

Large cylinders, say 70 inch diameter, 10 foot stroke, the contraction of diameter is $\frac{3}{8}$ inch at top, $\frac{1}{2}$ inch at bottom, and $\frac{1}{8}$ inch in 16 inches in length.

Thin brass is $\frac{1}{8}$ inch in 9 inches.

Thick brass is $\frac{1}{4}$ inch in 10 inches.

Zinc is $\frac{1}{8}$ inch in a foot.

Lead is $\frac{1}{8}$ inch in a foot.

Copper is $\frac{1}{8}$ inch in a foot.

Bismuth is $\frac{1}{8}$ inch in a foot.

Tin is $\frac{1}{8}$ inch in a foot.

METRIC CONVERSION TABLE

Millimetres $\times .03937$ = inches.
 Millimetres $\div 25.4$ = inches.
 Centimetres $\times .3937$ = inches.
 Centimetres $\div 2.54$ = inches.
 Metres $\times 39.37$ = inches.
 Metres $\times 3.281$ = feet.
 Metres $\times 1.094$ = yards.
 Kilometres $\times .621$ = miles.
 Kilometres $\div 1.6093$ = miles.
 Kilometres $\times 3280.8693$ = feet.
 Sq. Millimetres $\times .00155$ = sq. in.
 Sq. Millimetres $\div 645.1$ = sq. in.
 Sq. Centimetres $\times .155$ = sq. in.
 Sq. Centimetres $\div 6.451$ = sq. in.
 Sq. Metres $\times 10.764$ = sq. ft.
 Sq. Kilometres $\times 247.1$ = acres.
 Hectare $\times 2.471$ = acres.
 Cu. Centimetres $\div 16.383$ = cu. in.

Cu. Centimetres $\div 2.69$ = fluid drams.
 Cu. Centimetres $\div 29.57$ = fluid ounces.
 Cu. Metres $\times 35.315$ = cu. ft.
 Cu. Metres $\times 1.308$ = cu. yds.
 Cu. Metres $\times 264.2$ = gals. (231 cu. in.)
 Litres $\times 61.023$ = cu. in.
 Litres $\times 33.84$ = fluid ounces.
 Litres $\times 2.642$ = gals. (231 cu. in.)
 Litres $\div 3.78$ = gals. (231 cu. in.)
 Litres $\div 28.316$ = cu. ft.
 Hectolitres $\times 3.531$ = cu. ft.
 Hectolitres $\times 2.84$ = Bu. (2150.42 cu. in.)
 Hectolitres $\times .131$ = cu. yds.
 Hectolitres $\div 26.42$ = gals. (231 cu. in.)
 Grammes $\times 15.432$ = grains.
 Grammes $\div 981$ = dynes.
 Grammes (water) $\div 29.57$ = fluid oz.
 Grammes $\div 28.35$ = oz. avoirdupois.

Grammes per cu. cent. $\div 27.7$ = lbs. p. cu. in.
 Joule $\times .7373$ = ft. lbs.
 Kilo-grammes $\times 2.2046$ = pounds.
 Kilo-grammes $\times 35.3$ = oz. avoirdupois.
 Kilo-grammes $\div 907.2$ = tons (2000 lbs.)
 Kilo-gr. p. sq. cent. $\times 14.223$ = lbs. p. sq. in.
 Kilo-gram-metres $\times 7.233$ = ft. lbs.
 Kilo-gr. p. Metre $\times .672$ = lbs. per ft.
 Kilo-gr. p. cu. Metre $\times .062$ = lbs. p. cu. ft.
 Kilo-gr. p. Cheval $\times 2.235$ = lbs. p. H. P.
 Kilo-Watts $\times 1.34$ = Horse-power.
 Watts $\div 746$ = Horse-power.
 Watts $\times .7373$ = ft. pounds p. second.
 Calorie $\times 3.968$ = B. T. U.
 Cheval vapeur $\times .9863$ = Horse-power.
 (Centigrade $\times 1.8$) $\div 32$ = degrees Fahr.
 Franc $\times .193$ = Dollars.
 Gravity Paris = 980.94 centimetres per sec.

BAROMETRIC PRESSURES AT DIFFERENT ALTITUDES

With Equivalent Head of Water and the Vertical Suction Lift of Pumps

Altitude	Barometric Pressure	Equivalent Head of Water, Feet	Practical Suction Lift of Pump, Feet
Sea Level.....	14.70 lbs. per sq. in.	33.95	25
$\frac{1}{4}$ mile (1320 feet) above sea level	14.02 " "	32.38	24
$\frac{1}{2}$ " (2640 feet) " " "	13.33 " "	30.79	23
$\frac{3}{4}$ " (3960 feet) " " "	12.66 " "	29.24	21
1 " (5280 feet) " " "	12.02 " "	27.76	20
$1\frac{1}{4}$ " (6600 feet) " " "	11.42 " "	26.38	19
$1\frac{1}{2}$ " (7920 feet) " " "	10.88 " "	25.13	18
2 " (10560 feet) " " "	9.88 " "	22.82	17

FOR REFERENCE

Diameter of a circle $\times 3.1416$ = circumference.
 Diameter of a circle $\times .8862$ = side of an equal square.
 Diameter of a circle $\times .7071$ = side of an inscribed square.
 Square of a diameter $\times .7854$ = area of circle.
 Circumference of a circle $\times .31831$ = diameter.
 Side of a square $\times 1.128$ = diameter of equal circle.
 Square root of an area $\times 1.12837$ = diameter of equal circle.
 Square of the diameter of a sphere $\times 3.1416$ = convex surface.
 Cube of the diameter of a sphere $\times .5236$ = solidity.
 Diameter of a sphere $\times .806$ = dimensions of equal cube.
 Diameter of a sphere $\times .6667$ = length of equal cylinder.
 Square inches $\times .00695$ = square feet.
 Cubic inches $\times .00058$ = cubic feet.
 Cubic feet $\times .03704$ = cubic yards.
 Cylindrical inches $\times .0004546$ = cubic feet.
 Cylindrical feet $\times .02909$ = cubic yards.
 Cubic inches $\times .003607$ = imperial gallons.
 Cubic feet $\times .6232$ = imperial gallons.
 Cylindrical inches $\times .002832$ = imperial gallons.
 Cylindrical feet $\times 4.895$ = imperial gallons.
 183.346 circular inches = 1 square foot.
 2,200 cylindrical inches = 1 cubic foot.
 Avoirdupois pounds $\times .009$ = cwts.
 Avoirdupois pounds $\times .00045$ = tons.
 Lineal feet $\times .00019$ = statute miles.
 Lineal yards $\times .000568$ = statute miles.

To find the pressure in pounds per square inch of a column of water, multiply height of column in ft. by .434.

Doubling the diameter of a circle increases its area four times.

Area of a triangle = base multiplied by half the altitude.

Area of a sector of a circle = one-half the length of the arc multiplied by the radius of the circle.

To find the capacity (U. S. gallons) of cylindrical tanks, square the diameter expressed in inches, multiply by the length and by .0034.

USEFUL INFORMATION.

WEIGHTS OF VARIOUS SUBSTANCES PER CUBIC FOOT.

Names of Substances.	Average Weight, lbs.	Names of Substances.	Average Weight, lbs.
Anthracite, solid, of Pennsylvania.....	93	Limestones and Marbles.....	168
" broken, loose.....	54	" loose, in irregular fragments.....	96
" heaped bushel, loose.....	58	Mahogany, Spanish, dry.....	53
Ash, American white, dry.....	(80)	Honduras, dry.....	35
Asphaltum.....	38	Marbles, see Limestones.....	49
Brass (copper and zinc), cast.....	87	Masonry, of granite or limestone, well dressed.....	165
" rolled.....	504	" of mortar rubble.....	154
Brick, best pressed.....	524	" of dry rubble (well scabbled).....	138
" common hard.....	150	" of sandstone, well dressed.....	144
" soft, inferior.....	125	Mercury, at 32° Fahrenheit.....	849
Brickwork, pressed brick.....	100	Mica.....	183
" ordinary.....	140	Mortar, hardened.....	103
Cement, hydraulic, ground, loose, American, Rosen- dale.....	56	Mud, dry, close.....	80 to 110
Cement, hydraulic, ground, loose, American, Louis ville.....	50	" wet, fluid, maximum.....	120
Cement, hydraulic, ground, loose, English, Portland.....	90	Oak, live, dry.....	59
Cherry, dry.....	42	" white, dry.....	52
Chestnut, dry.....	41	" other kinds.....	32 to 45
Coal, bituminous, solid.....	84	Petroleum.....	55
" broken, loose.....	49	Pine, white, dry.....	25
" heaped bushel, loose.....	(74)	" yellow, Northern.....	34
Coke, loose, of good coal.....	27	" Southern.....	45
" heaped bushel.....	(38)	Platinum.....	1,342
Copper, cast.....	542	Quartz, common, pure.....	165
" rolled.....	548	Rosin.....	69
Earth, common loam, dry, loose.....	76	Salt, coarse, Syracuse, N. Y.....	45
" moderately rammed.....	95	" Liverpool, fine, for table use.....	49
" as a soft flowing mud.....	108	Sand, of pure quartz, dry, loose.....	90 to 108
Ebony, dry.....	76	" well shaken.....	99 to 117
Elm, dry.....	35	" perfectly wet.....	120 to 140
Flint.....	162	Sandstones, fit for building.....	151
Glass, common window.....	157	Shales, red or black.....	162
Gneiss, common.....	168	Silver.....	655
Gold, cast, pure, or 24 carat.....	1,204	".....	175
" pure hammered.....	1,217	Snow, freshly fallen.....	5 to 12
Granite.....	170	" moistened and compacted by rain.....	15 to 50
Gravel, about the same as sand, which see.....		Spruce, dry.....	25
Hemlock, dry.....	25	Steel.....	490
Hickory, dry.....	53	Sulphur.....	125
Hornblende, black.....	203	Sycamore, dry.....	37
Ice.....	58.7	Tar.....	62
Iron, cast.....	450	Tin, cast.....	459
" wrought, purest.....	485	Turf or Peat, dry, unpressed.....	20 to 30
" average.....	480	Walnut, black, dry.....	38
Ivory.....	711	Water, pure rain or distilled, at 60° Fahrenheit.....	62½
Lead.....	83	".....	64
Lignum Vitæ, dry.....	53	Wax, bees.....	60.5
Lime quick, ground, loose, or in small lumps.....	75	Zinc or Spelter.....	437
" thoroughly shaken.....	66		
" per struck bushel.....	(66)		

Green timbers usually weigh from one-fifth to one-half more than dry.

MELTING POINT OF METALS.

Name.	Fahr.	Fahr.	Authority.
Platina.....	-4,593		
Antimony.....	955	842	J. Lowthian Bell
Bismuth.....	487	507	
Tin (average).....	475		
Lead.....	622	620	"
Zinc.....	772	782	"
Cast Iron.....	2,010		
Wrought Iron.....	2,910	2,733	White, Pouillet
Steel.....	2,370	2,550	Gray, Welding Heat.
Copper (average).....	2,174		

GENERAL RULES FOR DETERMINING THE WEIGHT OF ANY PIECE OF WROUGHT IRON.

One cubic foot of wrought iron.....	= 480 lbs.
One square foot, one inch thick.....	= $\frac{480}{12}$ = 40 lbs.
One square inch, one foot long.....	= $\frac{480}{12 \times 12}$ = 3½ lbs.
One square inch, one yard long.....	= $3\frac{1}{2} \times 3$ = 10 lbs.

Hence, the weight of any piece of wrought iron in pounds per yard is equal to 10 times its area in square inches.

Example.—The area of a bar 3"×1"=3 square inches, and its weight is 30 lbs. per yard.

For round iron the weight per foot may be found by taking the diameter in quarter inches, squaring it, and dividing by 6

Example.—What is the weight of 2" round iron?
 $2'' = 8$ quarter inches. $8^2 = 64$.
 $\frac{64}{6} = 10\frac{2}{3}$ lbs. per foot of 2" round.

Example.—What is the weight of ¾" round iron?
 $\frac{3}{4}'' = 3$ quarter inches. $3^2 = 9$.
 $\frac{9}{6} = 1\frac{1}{2}$ lbs. per foot of ¾" round.

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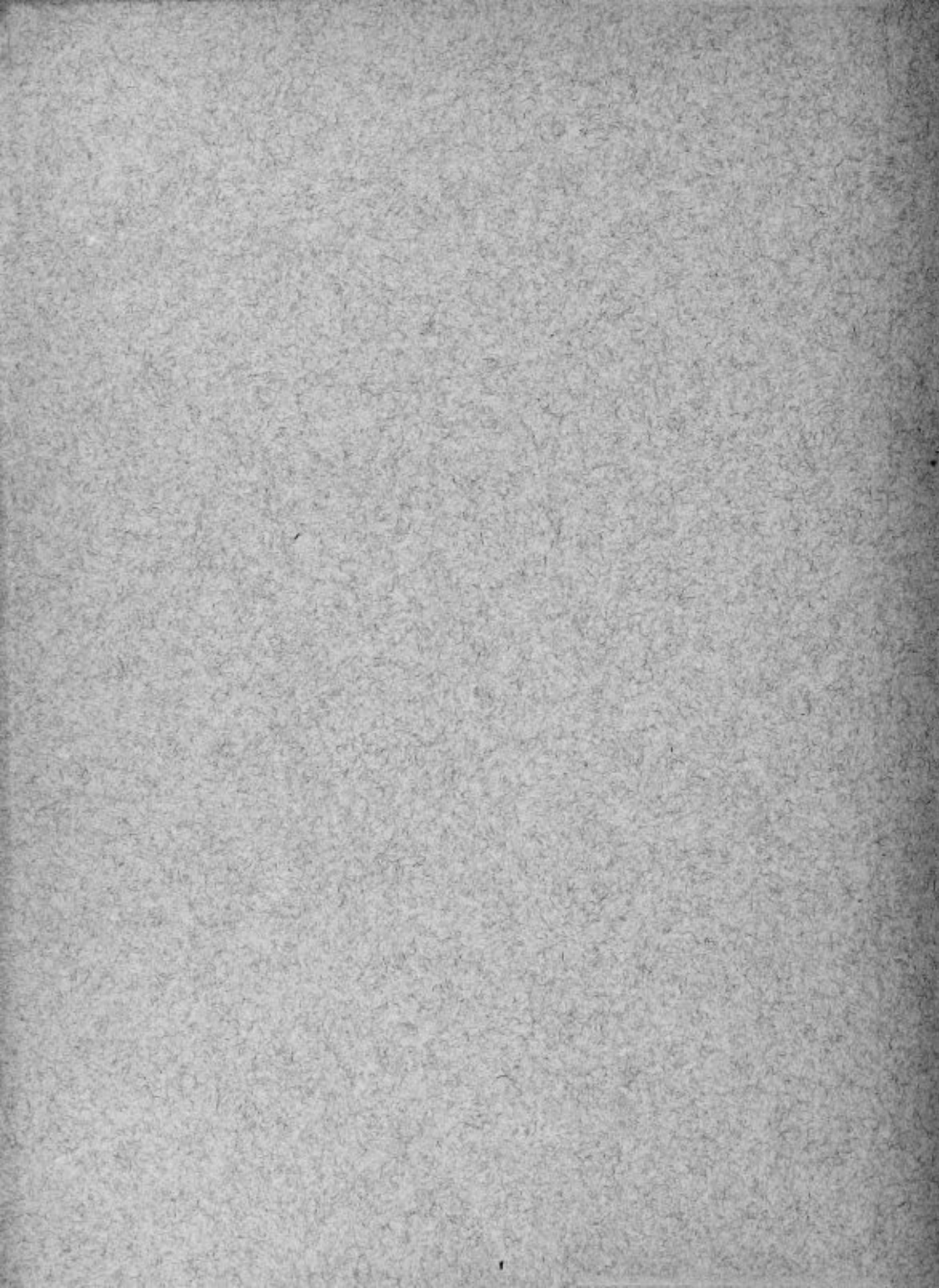
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ERRATA

SUPPLEMENT

APPLYING TO

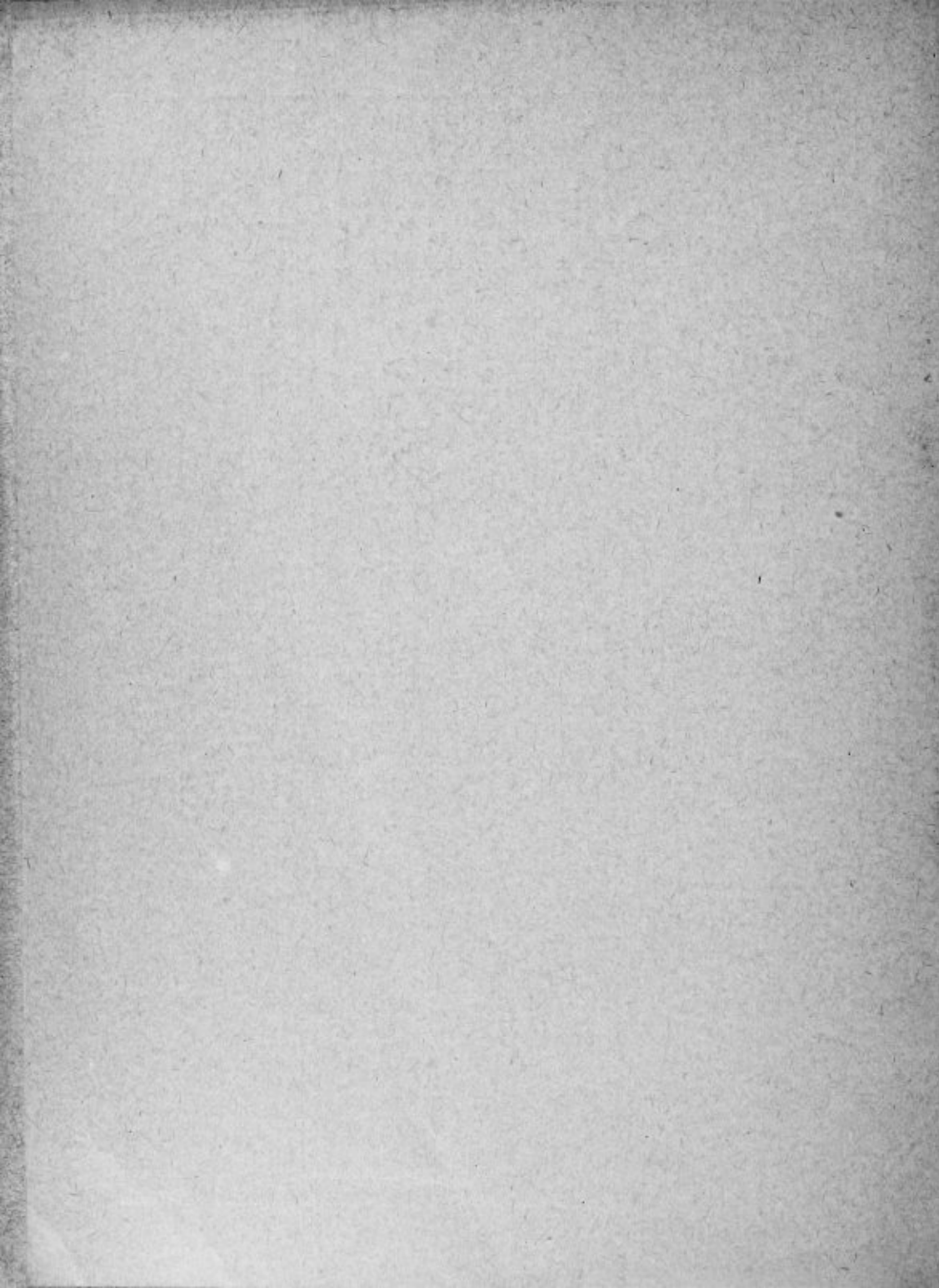
CATALOG No. 50

CORRECTING ERRORS AND
QUOTING ALL NEW LISTS

WHERE MANUFACTURERS HAVE MADE
CHANGES SINCE No. 50 CATALOG WENT TO PRESS

THERE HAVE BEEN A NUMBER
OF IMPORTANT CHANGES
PLEASE NOTE THEM

H.Channon Company
Chicago.



H.Channon Company. Chicago.

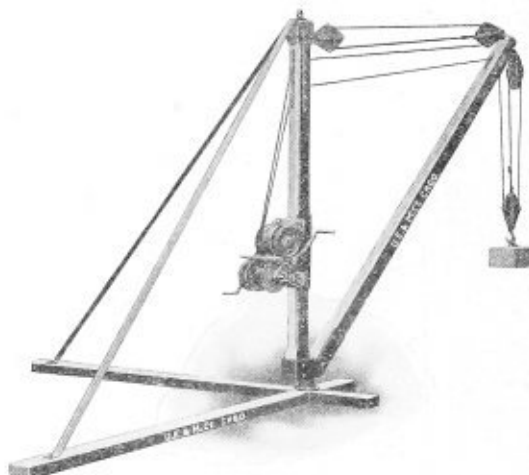
ADDITIONAL LINE OF BUILDERS' DERRICK

THE "ONTARIO" BUILDERS' DERRICK

With Mast and Boom Swing

Double
Drum
Single
Purchase
Winch.

Can furnish
Double
Purchase
Winch at
extra cost.



Boom
can be
raised or
lowered.

Easily
taken
apart and
put
together.

With Brake for either Drum.
Can be used with power by leading hoist line through snatch
block to engine.

Georgia Pine Timbers.

Best Iron Work.

Made in Three Sizes Only:

No. 1
Capacity
1000
Lbs.

Height of Mast, 8 feet.
Length of Boom, 11 feet.
Length of Sills, 10 feet.

Size of Mast, 6x6 inches.
Size of Boom, 4x5 inches.
Size of Sills, 3x6 inches.

Angle Iron Braces.

Complete with 7" Shv. Blocks and 100 ft. of 5/16" Steel Hoist Cable.

Price, \$75.00 NET. Extra Cable .06 per foot.

No. 2
Capacity
2000
Lbs.

Height of Mast, 9 feet.
Length of Boom, 12 feet.
Length of Sills, 12 feet.

Size of Mast, 6x6 inches.
Size of Boom, 5x6 inches.
Size of Sills, 4x6 inches.

Angle Iron Braces.

Complete with 8" Shv. Blocks and 200 ft. of 3/8" Steel Hoist Cable.

Price, \$90.00 NET. Extra Cable .06 per foot.

No. 3
Capacity
3000
Lbs.

Height of Mast, 12 feet.
Length of Boom, 15 feet.
Length of Sills, 13 feet.

Size of Mast, 6x6 inches.
Size of Boom, 6x6 inches.
Size of Sills, 4x6 inches.

Angle Iron Braces.

Complete with 9" Shv. Blocks and 260 ft. of 7/16" Steel Hoist Cable.

Price, \$110.00 NET. Extra Cable .07 per foot.

We Do Not Use Any Malleable in Any of Our Derricks.

PILE POINTS OR SHOES.

Square Pile Points.

Change list price on size 4x4 to \$1.50 each.
Page 48.

WROUGHT IRON TURNBUCKLES

Outside Diam- eter, Screw, Inches	Length in Clear between Heads Inches	Price Each	
		Black	Galvanized
1/2	4 1/2	\$.80	\$.90
3/4	4 1/2	.90	1.10
1	5	1.00	1.25
1 1/4	6	1.30	1.50
1 1/2	7	1.70	1.85
1 3/4	8	1.80	2.20
2	9	2.50	3.25
2 1/4	10	4.25	5.00
2 1/2	11	4.75	5.50
2 3/4	12	5.25	7.00
3	13	6.25	8.25
3 1/4	14	7.50	9.50
3 1/2	15	9.00	11.00
3 3/4	16	13.00	15.00
4	16	17.00	20.00
4 1/4	16	25.00	28.00

The above list cancels list shown on page 80.

BOILERS

Tabasco Water Heater

Change list prices as follows:

Heater No.	Magazine Feed	Surface Burner
17	\$ 72.00	\$ 66.00
18	76.00	70.00
21	90.00	80.00
22	96.00	88.00
25	126.00	116.00
26	132.00	122.00
27	142.00	130.00
30	160.00	144.00
31	168.00	156.00
32	176.00	164.00

Tabasco Junior

Heater No.	Price Each
1	\$40.00
2	42.00
3	54.00
4	56.00
5	64.00
6	66.00

For full details and specifications see page 109.

"WITTE" GAS AND GASOLINE AND DIS- TILLATE ENGINES.

For complete specifications see page 132.

Actual Horse Power	Price Without Sub-Base	Add for Sub-Base
4	\$ 240.00	\$ 9.00
6	270.00	12.00
9	330.00	16.00
12	500.00	20.00
15	550.00	25.00
20	780.00	35.00
25	850.00	40.00
35	1250.00	60.00

This list cancels list shown on page 132.

"WITTE" HOPPER COOLED STATIONARY ENGINES.

For complete specifications see list on page 135.

Actual Horse Power	Price Without Sub-Base	Add for Sub-Base
4	\$215.00	\$ 9.00
6	240.00	12.00
9	320.00	16.00
12	480.00	20.00
15	620.00	25.00

This price list cancels list on page 135.

NO. 85 LIGHTING SETS

K. W.	Eng.	Speed	Weight	Net List
2 1/2	4x3 1/2	650	450 lbs.	\$325.00
3 1/2	5x4	525	800 lbs.	375.00
6	6x5	425	1600 lbs.	500.00
8	7x6	375	2300 lbs.	650.00
10	8x6	325	2800 lbs.	750.00

For further particulars see page 141.

B. AND D. ONE-WIRE CLEATS.

For complete specifications see list on page 144.

No.	Price per 1000
345	\$ 36.63
346	50.00
347	60.00
348	72.00
349	95.00
350	120.00
351	160.00
352	400.00

This price list cancels list shown on page 144.

FLEXDUCT AND CIRCULAR LOOM.

Change list price on "hole 1 1/4 inch" per
foot to \$0.20.

This list cancels list on above size. Page
144.

STANDARD IRON FOOT VALVES WITH STRAINERS.

Page 199.

Change list price on 6-inch Black Screwed
from \$14.25 to \$14.75.

Change list price on 15-inch Flanged from
\$150.00 to \$175.00.

CONNEVILLE ROTARY POSITIVE PRES- SURE BLOWERS.

For complete specifications see list on page 242

No.	Price With One Pulley	Price With Tight and Loose Pulleys
35	\$22.50	\$24.00
40	35.00	37.00
50	60.00	62.50

No. 35. Hand Blower. Price.....\$24.00

This price list cancels list shown on page 242

CYCLONE DUST COLLECTORS.

Change list price on size No. 4 from \$15.00
to \$20.00. Page 243.

H.Channon Company. Chicago.

FLEXIBLE INCANDESCENT LAMP CORD

Number	22	20	18	16	14	12	10
Price per 1,000 feet, ...	\$18.50	\$22.00	\$25.80	\$32.80	\$48.80	\$75.50	\$115.50

The above list cancels list shown on page 143.

STANDARD 250-VOLT SNAP SWITCHES.

No.	Std. Pkg.	Price Each
2000—5 Amps. S. P. slotted.....	250	\$0.28
2047—5 Amps. S. P. slotted Ind.....	250	.32
2001—10 Amps. S. P. slotted.....	100	.40
2048—5 Amps. S. P. slotted Ind.....	100	.45
2009—10 Amps. D. P. Concealed.....	100	.66
2038—10 Amps. D. P. Concealed Ind.....	100	.76

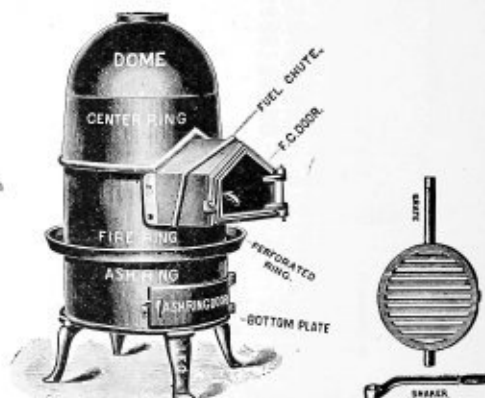
The above list cancels list shown on page 147.

THE "PERFECT" SAND DRIER.

These Driers are built in the fashion of an hour glass, the wet sand being shoveled against the stove, and as it dries it runs out through apertures in the perforated ring which surrounds the bottom of the hopper. The amount of sand that will pass through this machine in a given time is variable and depends largely upon the conditions under which it is used; that is to say, how wet the sand is when it is put in the hopper and also the intensity of the fire maintained in the stove. The furnace is arranged to use any kind of solid fuel, such as hard or soft coal or wood. These driers are for use with clear sand only, as earth or clay will merely bake and will not discharge itself from the machine. These driers are claimed to be the best ever put upon the market for preparing sand for use on locomotives and street cars.



No.	Capacity per Day, Tons	Weight, Lbs.	Price Each
1	10	1100	\$93.75
2	5	600	56.25

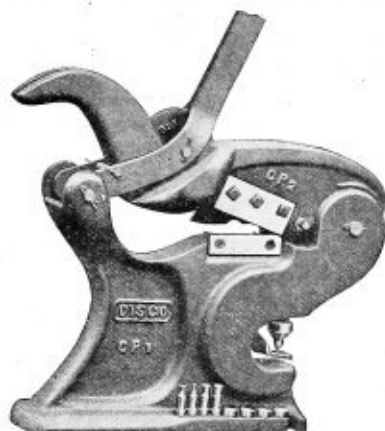


Cut without Hopper, Showing Names of Parts

"WILLIAMS" PIPE AND BOLT THREADING MACHINES

Mach. No.	Capacity	Belt Drive	Motor Drive	Engine Drive	Dies, Set	Nipple Holders	Rear Griping Chuck	Nut Chuck	Floor Space, Feet	Weight, Lbs.	Boxed for Export	Cubic Feet
1	1/4 to 2	\$132.50	\$348.75	.....	\$2.50	\$25.00	.....	\$20.00	2 x 5	1,000	\$15.00	80
1 1/2	1/2 to 3	343.75	500.00	\$427.50	3.50	30.00	\$25.00	20.00	2 1/2 x 6	1,500	15.00	85
2	1 to 4	500.00	687.50	632.50	4.00	50.00	40.00	25.00	3 x 6	2,500	20.00	100
3	1 1/2 to 6	625.00	812.50	740.00	5.00	60.00	50.00	25.00	3 x 7	3,000	25.00	110
4	2 to 8	937.50	1,182.50	1,090.00	7.00	100.00	75.00	.....	3 1/2 x 8 1/2	6,500	50.00	145
5	3 to 12	1,300.00	1,762.50	1,643.75	12.00	160.00	100.00	.....	4 x 9	8,500	50.00	165

The above list cancels list shown on page 233.



Style C P

CISCO COMBINATION PUNCH AND SHEAR.

The punches are held in place by a cap nut slipped over punch and screwed on the ram; can be taken off and changed quickly. The die is dropped in a seat in base directly under punch and can be removed by the fingers. Especially adapted for punching angles, as the die is near edge of base.

Maximum Capacity.

Punch, $\frac{1}{2} \times \frac{1}{2}$.

Shear, $\frac{1}{2} \times 4$ flat.

Shear, $\frac{3}{8}$ round.

Punches and dies furnished $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, unless otherwise specified.

Length of lever, 52 inches.

Depth of throat, $2\frac{1}{2}$ inches.

Weight, 325 lbs.

Price, each, net.....\$40.00

STANDARD CONSTRUCTION CRUCIBLE CAST STEEL HOISTING ROPE.

Diameter, Inches	List Price per Foot	Approx. Circum. Inches	Weight per Foot, Lbs.	Approx. Breaking Stress, Tons	Proper Working Load, Tons	Smallest Diam. Drum or Sheave, Feet
24	\$2.10	84	11.95	211	42.2	11
24	1.75	77	9.85	170	34	10
24	1.44	77	8.00	133	26.6	9
24	1.16	67	6.30	106	21.2	8
24	.90	57	4.85	85	17	7
24	.77	57	4.15	72	14.4	6.5
24	.66	47	3.55	64	12.8	6
24	.56	47	3.00	56	11.6	5.5
24	.46	47	2.45	47	9.4	5
24	.38	37	2.00	38	7.6	4.5
24	.31	37	1.58	30	6	4
24	.24	27	1.20	23	4.6	3.5
24	.19	27	0.89	17.6	3.5	3
24	.14	27	0.62	12.5	2.5	2.5
24	.12	17	0.50	10	2	2.25
24	.11	17	0.39	8.4	1.68	2
24	.10	17	0.30	6.5	1.30	1.75
24	.094	17	0.22	4.8	.96	1.5
24	.094	17	0.15	3.1	.62	1.25
24	.09	17	0.10	2.2	.44	1

The above list cancels list on page 305, Catalog No. 50.

IRON HOISTING ROPE.

Diameter in Inches	List Price per Foot	Approximate Circumference in Inches	Weight per Foot in Lbs.	Approximate Breaking Stress in Tons	Proper Working Load in Tons	Minimum Diameter of Drum or Sheave in Feet
1 1/2	\$0.40	4	2.45	22.8	4.56	7.5
1 1/2	.33	3 1/2	2.00	18.6	3.72	7.0
1 1/2	.26	3	1.58	14.5	2.90	6
1 1/2	.20	2 1/2	1.20	11.8	2.36	5.5
1 1/2	.16	2 1/2	0.89	8.5	1.70	4.5
1 1/2	.12	2	0.62	6	1.20	4
1 1/2	.10	1 1/2	0.50	4.7	.94	3.5
1 1/2	.08 1/2	1 1/2	0.39	3.9	.78	3
1 1/2	.07 1/2	1 1/2	0.30	2.9	.58	2.75
1 1/2	.07	1 1/2	0.22	2.4	.48	2.25
1 1/2	.06 1/2	1	0.15	1.5	.30	2
1 1/2	.06 1/2	1	0.10	1.1	.22	1.50

The above list cancels list on page 305, Catalog No. 50.

H.Channon Company. Chicago.

"BULLOCK" WIRE ROPE.

Standard Construction—6 Strands of 19 Wires Each.

Diameter in inches	Price per Foot	Weight per Foot in Pounds	Approx. Breaking Stress in Tons of 2,000 Lbs.	Proper Working Load in Tons of 2,000 Lbs.
$\frac{3}{16}$	\$0.14½	.22	6.75	1.35
$\frac{1}{2}$	.17	.39	12.1	2.40
$\frac{5}{16}$	.22½	.62	19	3.80
$\frac{3}{8}$	.31	.89	26.3	5.30
$\frac{7}{16}$	.39	1.20	35	7.00
1	.50	1.53	45	9.90
$1\frac{1}{16}$	.62	2.00	56	11.00
$1\frac{1}{8}$	.75	2.45	69	14.00
$1\frac{1}{4}$	.90	3.00	84	17.00
$1\frac{3}{8}$	1.10	3.55	98	20.00
$1\frac{1}{2}$	1.60	4.85	133	27.00
2	1.85	6.30	166	33.00

Extra Flexible Construction—8 strands of 19 Wires Each.

$\frac{1}{16}$	\$0.19	.35	9.5	1.9
$\frac{3}{16}$	.25	.56	15.	3.
$\frac{1}{4}$	.34	.80	22.	4.4
$\frac{5}{16}$	.43	1.03	28.	5.6
$\frac{3}{8}$	.55	1.42	36.	7.2
1	.63	1.80	46.	9.2
$1\frac{1}{16}$	.82	2.20	56.	11.
$1\frac{1}{8}$	.93	2.70	68.	13.
$1\frac{1}{4}$	1.14	3.19	80.	16.

Special Flexible Dredge Rope—6 Strands of 37 Wires Each.

$\frac{3}{16}$	\$17.50 per 100 ft.	.22	5.30	1.06
$\frac{1}{2}$	20.00 per 100 ft.	.39	9.75	1.9
$\frac{5}{16}$	27.00 per 100 ft.	.62	16.00	3.2
$\frac{3}{8}$	36.00 per 100 ft.	.89	23.	4.6
$\frac{7}{16}$	46.00 per 100 ft.	1.20	29.	5.8
1	59.00 per 100 ft.	1.58	37.	7.4
$1\frac{1}{16}$	75.00 per 100 ft.	2.00	46.	9.2
$1\frac{1}{8}$	86.00 per 100 ft.	2.45	58.	11.
$1\frac{1}{4}$	105.00 per 100 ft.	3.00	71.	14.
$1\frac{3}{8}$	125.22 per 100 ft.	3.55	84.	17.

Larger sizes quoted upon request.
The above lists cancel lists shown on page 306.

GALVANIZED IRON ROPE

Approximate Diameter in inches	Circumference in inches	Price per Foot		Weight per Foot in lbs.	Approximate Breaking Strain in tons	Approximate Diameter in inches	Circumference in inches	Price per Foot		Weight per Foot in lbs.	Approximate Breaking Strain in tons
		5 Strands, 7 Wires Each	With 12 Wires to the Strand					With 7 Wires to the Strand	With 12 Wires to the Strand		
$\frac{3}{16}$	$\frac{1}{2}$	\$0.02	.....	0.040	61	$\frac{1}{16}$	$\frac{1}{2}$	\$0.11	.....	1.03	9.4
$\frac{1}{4}$	$\frac{5}{8}$	.02½	.....	0.063	79	$\frac{1}{8}$	$\frac{3}{4}$	.13	.....	1.20	11.1
$\frac{5}{16}$	$\frac{3}{4}$	.02¾	.....	0.090	99	1	3	.15	\$0.16	1.58	14.1
$\frac{3}{8}$	$\frac{7}{8}$	.03	.....	0.125	120	$1\frac{1}{16}$	$\frac{3}{4}$	.174	.....	1.77	16.1
		With 7 Wires to the Strand				$1\frac{1}{8}$	$\frac{7}{8}$	.19½	.21	2.00	18
		\$0.03½	.....	0.15	142	$1\frac{1}{4}$	3½	.224	.24	2.21	19
$\frac{1}{2}$	1	.04½	.....	0.22	195	$1\frac{1}{2}$	4	.25	.26½	2.45	23
$\frac{5}{8}$	$1\frac{1}{8}$	.05	.....	0.30	235	$1\frac{3}{8}$	4½	.28½	.30½	3.00	26
$\frac{3}{4}$	$1\frac{1}{4}$	.06	.....	0.39	289	$1\frac{1}{2}$	5	.35	.37	3.55	28
$\frac{7}{8}$	$1\frac{3}{4}$	.07	.....	0.50	446	$1\frac{3}{4}$	5½	.38	.40	4.15	35
1	2	.08	.....	0.62	570	$1\frac{7}{8}$	6	.41	.43	4.42	38
$1\frac{1}{8}$	$2\frac{1}{4}$	.09	.....	0.89	780	2	6½	.44	.46	4.85	42

The above list cancels list shown on page 310.

TRANSMISSION OR HAULAGE ROPE

Composed of 6 Strands and Hemp Center, Each Strand Having 7 Wires
CRUCIBLE CAST STEEL

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
1 1/2	\$0.044	0.15	3.5	.70	21
1 1/4	.051	0.22	4.6	.92	22
1 1/8	.061	0.30	5.5	1.10	23
1 1/2	.08	0.39	7.7	1.50	24
1 1/4	.10	0.50	10	2	25
1 1/8	.12	0.62	13	2.60	26
1 1/2	.17	0.89	18.6	3.70	27
1 1/4	.22	1.20	24	4.80	28
1 1/8	.29	1.58	31	6.20	29

EXTRA STRONG CRUCIBLE CAST STEEL ROPE, WITH 7 WIRES TO STRAND 6 Strands and 1 Hemp Core

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
1 1/2	\$0.06	0.22	5.25	1.05	2.75
1 1/4	.07	0.30	6.25	1.25	3
1 1/8	.09	0.39	8.85	1.80	3.5
1 1/2	.12	0.50	11.00	2.20	4
1 1/4	.14	0.62	14.50	2.90	4.5
1 1/8	.17	0.75	16.70	3.30	4.75
1 1/2	.20	0.89	21	4.20	5
1 1/4	.27	1.20	28	5.60	6
1 1/8	.35	1.58	35	7.00	7

SWEDISH IRON ROPE Composed of 6 Strands and a Hemp Center, Each Strand Having 7 Wires

This rope is used principally for transmission of power.

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
1 1/2	\$0.031	0.125	1.2	0.24	3
1 1/4	.032	0.15	1.7	0.34	3.5
1 1/8	.04	0.22	2.2	0.44	4
1 1/2	.05	0.30	2.6	0.52	4.5
1 1/4	.06	0.39	3.7	0.74	5.5
1 1/8	.08	0.50	4.8	0.96	6
1 1/2	.10	0.62	6	1.20	7
1 1/4	.12	0.75	7.3	1.50	7.25
1 1/8	.14	0.89	8.8	1.70	7.5
1 1/2	.18	1.20	12	2.40	9
1 1/4	.24	1.58	15	3.00	10.5

FLEXIBLE WIRE SASH CORD

Composed of 6 Strands and a Cotton Core, Each Strand Having 7 Wires

Diameter in inches	Price per foot			Approximate Breaking Stress in Pounds		
	Iron, Annealed or Bright	Tinned or Galvanized Iron	Copper	Bright Iron	Annealed Iron	Bright Copper
1 1/2	\$0.011	\$0.012	\$0.03	140	110	90
1 1/4	.012	.013	.03	160	120	100
1 1/8	.013	.014	.04	180	140	110
1 1/2	.014	.015	.05	200	160	130
1 1/4	.015	.016	.06	220	180	150
1 1/8	.016	.017	.07	240	200	160
1 1/2	.017	.018	.08	260	220	180
1 1/4	.018	.019	.09	280	240	200

GALVANIZED MAST-ARM OR ARC-LIGHT ROPE

Composed of 9 Strands and 1 Cotton Core, Each Strand Having 4 Wires

Diameter in inches	Price per foot	Weight per foot in pounds	Approximate Breaking Stress in pounds
1 1/2	\$0.022	0.77	1,125
1 1/4	.032	1.07	1,530
1 1/8	.05	1.63	2,200

The above lists cancel lists shown on page 309.

CHANNON'S LOCOMOTIVE SWITCH OR WRECKING ROPES.

List Price and Diameter in Inches.

Length in Feet	1 1/2	1 1/4	1 1/8	1 1/2	1	3/4	5/8
Breaking Strain, Tons	72	62	50	42	34	26	19
20 ft.	\$30.45	\$24.45	\$19.20	\$17.10	\$13.20	\$11.55	\$ 7.80
25 ft.	33.75	27.25	21.50	19.00	14.75	12.75	8.75
30 ft.	37.05	30.05	23.80	20.90	16.30	13.95	9.70
35 ft.	40.35	32.85	26.10	22.80	17.85	15.15	10.65
40 ft.	43.65	35.65	28.40	24.70	19.40	16.35	11.60
45 ft.	46.95	38.45	30.70	26.60	20.95	17.55	12.55
50 ft.	50.25	41.25	33.00	28.50	22.50	18.75	13.50

The above list cancels list shown on page 312.

CHANNON "RELIANCE" ELEVATOR CABLES.

Diameter in Inches	List Price Per Foot	Weight Per Foot, Lbs.	Approximate Breaking Strain in Tons of 2,000 Lbs.	Proper Size of Drum or Sheave in Feet
$\frac{1}{4}$	\$0.06 $\frac{1}{2}$	.10	1.1	1.50
$\frac{1}{2}$	.06 $\frac{1}{4}$	.15	1.5	2
$\frac{3}{4}$	.07	.22	2.4	2.25
$\frac{7}{8}$	.07 $\frac{1}{2}$	.30	2.9	2.75
$1\frac{1}{8}$	.08 $\frac{1}{4}$	.39	3.9	3
$1\frac{1}{4}$	.10	.50	4.7	3.50
$1\frac{3}{8}$	.12	.62	6	4.00
$1\frac{1}{2}$	.16	.89	8.5	4.50
$1\frac{7}{8}$	.20	1.20	11.8	5.50
2	.26	1.58	14.5	6.00
$2\frac{1}{8}$	.33	2.00	18.6	7.00
$2\frac{1}{4}$	.40	2.45	22.8	7.50

The above list cancels list shown on page 307, Catalog No. 50.

STANDARD FLOW STEEL HOISTING ROPE.

Composed of 6 Strands and a Hemp Center, Each Strand Having 19 Wires.

Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet	Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
$\frac{2}{32}$	\$1.58	6.30	1.40	28.0	8	$\frac{2}{32}$	\$0.26	0.89	23	4.6	3
$\frac{1}{16}$	1.30	4.85	1.12	22.0	7	$\frac{1}{16}$	.19	0.62	15.50	3.1	2.50
$\frac{1}{8}$	1.08	4.15	.94	19.0	6.5	$\frac{1}{8}$	.16	0.50	12.30	2.4	2.25
$\frac{3}{16}$	.93	3.55	.82	16.0	6	$\frac{3}{16}$	.14	0.39	10	2	2
$\frac{1}{4}$	.79	3.00	.72	14.0	5.5	$\frac{1}{4}$	.13	0.30	8	1.6	1.75
$\frac{5}{16}$	.65	2.45	.58	12.0	5	$\frac{5}{16}$	.12	0.22	5.75	1.15	1.50
$\frac{3}{8}$	.54	2.00	.47	9.5	4.5	$\frac{3}{8}$	.12 $\frac{1}{2}$	0.15	3.80	.76	1.25
$1\frac{1}{8}$	.43	1.58	.38	7.6	4	$1\frac{1}{8}$	.12	0.10	2.65	.53	1
$\frac{1}{2}$	.26	1.20	.29	5.8	3.5						

The above list cancels list shown on page 308.

GALVANIZED STEEL HAWSERS

Twelve Wires to the Strand—Six Strands—
Seven Hemp Cores.Thirty-seven Wires to the Strand—Six Strands—
—One Hemp Core—Very Flexible.

Approximate Diameter in inches	Circumference in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds	Circumference in inches of New Manila Hawser of Equal Strength	Approximate Diameter in inches	Circumference in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds
$1\frac{1}{4}$	3 $\frac{1}{2}$	\$0.31	1.33	26	8 $\frac{1}{2}$	$\frac{1}{16}$	3	\$0.37	1.58	31.5
$1\frac{1}{8}$	3 $\frac{1}{4}$	.33	1.47	28	9 $\frac{1}{4}$	$\frac{1}{8}$	3 $\frac{1}{2}$	.48	2.00	42.0
$1\frac{1}{2}$	4	.35	1.63	31	10	$\frac{3}{16}$	4 $\frac{1}{2}$	.60	2.45	54.0
$1\frac{3}{8}$	4 $\frac{1}{4}$	.38	2.00	38	11	$\frac{1}{4}$	4 $\frac{1}{2}$	.65	3.00	66.0
$1\frac{1}{8}$	4 $\frac{1}{2}$	.41	2.16	41	11 $\frac{1}{2}$	$\frac{5}{16}$	4 $\frac{3}{4}$	.77	3.55	76.0
$1\frac{1}{4}$	4 $\frac{3}{4}$	.44	2.36	45	12	$\frac{3}{8}$	5	.84	4.15	87.0
$1\frac{3}{8}$	5	.49	2.76	53	12 $\frac{1}{2}$	$\frac{1}{2}$	5 $\frac{1}{2}$	.98	4.85	104.0
$1\frac{1}{2}$	5 $\frac{1}{4}$	.53	2.94	57	13	$\frac{5}{8}$	6 $\frac{1}{2}$	1.20	6.30	132.0
$1\frac{3}{4}$	5 $\frac{3}{4}$	.57	3.23	61	13 $\frac{1}{2}$					

The above lists cancel lists shown on page 311.

Our Bullock Wire Rope is the strongest, toughest and in every way the best wire rope made.

H.Channon Company. Chicago.

9

EXTRA STRONG CRUCIBLE CAST STEEL HOISTING ROPE.

Composed of 6 Strands and a Hemp Center, Each Strand Having 19 Wires.

This Rope is a grade intermediate between regular crucible and standard plow steel.

Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet	Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
1	\$0.36	1.58	34	6.80	4	$\frac{1}{2}$	\$0.12	0.39	9.2	1.84	2
$\frac{1}{4}$	.28	1.20	26	5.20	3.5	$\frac{3}{8}$	.11	0.30	7.25	1.45	1.75
$\frac{3}{8}$	.22	0.89	20.2	4.04	3	$\frac{1}{2}$	.11	0.22	5.30	1.06	1.50
$\frac{1}{2}$	.16	0.62	14	2.80	2.5	$\frac{3}{4}$	.10	0.15	3.50	.70	1.25
$\frac{3}{4}$	.14	0.50	11.2	2.24	2.25	1	.10	0.10	2.43	.49	1

The above list cancels list shown on page 308.

CRUCIBLE CAST STEEL.

Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet	Diameter in inches	List Price per foot	Weight per foot in pounds	Approximate Breaking Stress in tons of 2,000 pounds	Proper Working Load in tons of 2,000 pounds	Minimum Diameter of Drum or Sheave in feet
$\frac{1}{4}$	\$0.73	3.19	58	11.6	3.75	$\frac{3}{8}$	\$0.16	.56	10.9	2.18	1.75
$\frac{3}{8}$	.62	2.70	51	10.2	3.5	$\frac{1}{2}$	.14	.45	8.7	1.74	1.5
$\frac{1}{2}$	.51	2.20	42	8.4	3.2	$\frac{3}{4}$	.12	.35	7.3	1.46	1.33
$\frac{3}{4}$	.42	1.80	34	6.8	2.83	$\frac{1}{2}$	.11	.27	5.7	1.14	1.16
1	.34	1.42	26	5.2	2.5	$\frac{3}{4}$	.10	.20	4.2	.84	1
$\frac{1}{2}$	.27	1.08	20	4	2.16	1	.10	.13	2.75	.55	.83
$\frac{3}{4}$	.21	.80	15.3	3.06	1.83	$\frac{1}{2}$	.10	.09	1.80	.36	.75

The above list cancels list shown on page 308.

GALVANIZED CRUCIBLE CAST STEEL WIRE ROPE

Approximate Diameter in inches	Circumference in inches	Price per Foot		Weight per Foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.	Approximate Diameter in inches	Circumference in inches	Price per Foot		Weight per Foot in lbs.	Approximate Breaking Stress in tons of 2,000 lbs.
		With 7 Wires to the Strand	With 19 Wires to the Strand					With 7 Wires to the Strand	With 19 Wires to the Strand		
$\frac{1}{16}$	1	\$0.04	\$0.10	0.15	3.2	$\frac{1}{16}$	24	\$0.22	\$0.23	1.03	19
$\frac{1}{8}$	1 $\frac{1}{2}$	.06	.10	0.22	4.2	$\frac{1}{8}$	24	.24	.26	1.20	22
$\frac{3}{16}$	1 $\frac{1}{2}$	.07	.11	0.30	5.0	$\frac{3}{16}$	31	.31	.34	1.58	28
$\frac{1}{4}$	1 $\frac{3}{4}$	.08	.11	0.34	6.0	$\frac{1}{4}$	31	.35	.38	1.77	31
$\frac{5}{16}$	1 $\frac{3}{4}$	.08	.12	0.39	7.0	$\frac{5}{16}$	34	.39	.41	2.00	34
$\frac{3}{8}$	1 $\frac{3}{4}$	.11	.13	0.50	9.0	$\frac{3}{8}$	34	.44	.46	2.21	38
$\frac{7}{16}$	2	.13	.15	0.62	11.7	$\frac{7}{16}$	4	.47	.50	2.45	42
$\frac{1}{2}$	2 $\frac{1}{2}$	.18	.20	0.89	16.8						

The above list cancels list shown on page 310.

TILLER ROPE.

Change list price per foot $\frac{1}{2}$ inch iron to \$0.11 $\frac{1}{2}$.

Change list price per foot $\frac{3}{8}$ inch cast-steel to \$0.20.

For complete list except above see page 307.

WE MAKE A VERY LARGE LINE OF WIRE ROPE BLOCKS. THESE WILL BE FOUND LISTED IN OUR CATALOG No. 50, PAGES 332 TO 335.

H.Channon Company. Chicago.

GALVANIZED IRON OR CAST STEEL RUNNING ROPE Twelve Wires to the Strand—Six Strands—Seven Hemp Cores.

Approximate Diameter in inches	Circumference in inches	Price per foot		Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds		Approximate Diameter in inches	Circumference in inches	Price per foot		Weight per foot in pounds	Approximate Breaking Stress in Tons of 2,000 pounds	
		Iron	Cast Steel		Iron	Cast Steel			Iron	Cast Steel		Iron	Cast Steel
$\frac{1}{16}$	$\frac{1}{4}$	\$0.12	\$0.16 $\frac{1}{2}$	.59	5.1	11.5	$\frac{1}{8}$	$\frac{1}{2}$	\$0.05 $\frac{1}{2}$	\$0.07	.10	.82	1.98
$\frac{1}{8}$	$\frac{3}{8}$	.14 $\frac{1}{2}$	.20	.68	6.0	13.5	$\frac{3}{16}$	$\frac{5}{8}$	.06	.07 $\frac{1}{2}$	.14	1.30	2.85
$\frac{1}{4}$	$\frac{1}{2}$	.17	.23	.80	6.9	15.5	$\frac{1}{2}$	$\frac{3}{4}$	.06 $\frac{1}{2}$	.08 $\frac{1}{2}$	.20	1.70	3.90
$\frac{3}{8}$	$\frac{3}{4}$	.20	.27	1.05	8.7	19.5	$\frac{5}{8}$	$\frac{7}{8}$	.07	.09	.26	2.20	5.00
$\frac{1}{2}$	$\frac{1}{2}$	.22	.30	1.18	10.1	22.5	$\frac{3}{4}$	$\frac{1}{2}$	.08	.11	.33	2.80	6.50
							$\frac{7}{8}$	2	.10	.14	.42	3.60	8.00

The above list cancels list shown on page 311.

NEW ADDITIONAL LINE OF HOIST HOLDERS.

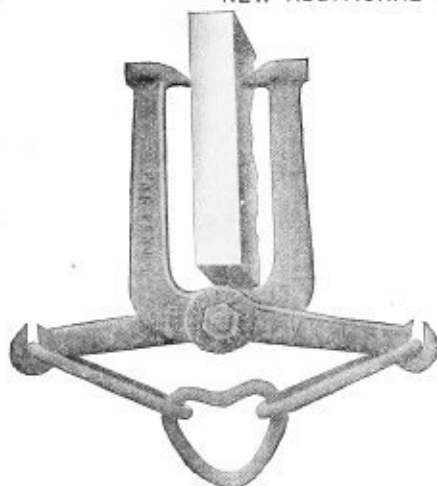
CISCO HOIST HOLDERS.

The heavier the pull the stronger it clamps

Constructed of very best material throughout. Body is of crucible steel casting, links of hand forged iron. Frame swings on a special bolt with a full body. Holder is provided with a spring for holding jaws securely to hoist or beam until the weight is suspended.

In adjusting to an I-beam, place wooden blocks on both sides of beam and clamp jaws into blocks. This method relieves a part of the strain on the shoulder and distributes it more uniformly over the beam, than would be the case if the hoist was to be applied directly to the beam.

All hoists are tested at twice their capacity.



No.	Capacity, Pounds	Can be Attached to Beam, Size, Inches	Weight, Pounds	Net Price, Each
0	500	1 to 3	5	\$ 2.75
1	1,500	2 to 6	14	5.50
2	2,500	4 to 9	27	9.00
3	3,000	8 to 14	35	11.00

DOUBLE FLANGED PULLEYS

Single Flanged Pulleys Take One-half of Following List. Three Flanged Pulleys Take One-half More Than Following List:

Diameter, inches	Price	Diameter, inches	Price
6 to 7	\$ 2.40	24 to 25	\$11.50
8 to 9	3.10	26 to 27	13.05
10 to 11	3.90	28 to 29	14.70
12 to 13	4.70	30 to 31	16.40
14 to 15	5.65	32 to 37	21.95
16 to 17	6.60	40 to 41	26.35
18 to 19	7.60	48 to 50	37.60
20 to 21	8.80	52 to 54	42.25
22 to 23	10.15	60 to 62	52.25

Additional Price to Be Added to the List Price per Pair for

TIGHT AND LOOSE PULLEYS

Diameter, inches	Width of Face, Inches														
	3 to 4	5 to 6	7 to 8	9 to 10	11 to 12	13 to 14	15 to 16	17 to 18	19 to 20	21 to 22	23 to 24	25 to 26	27 to 28	29 to 30	31 to 32
6 to 9"	\$1.30	\$2.00	\$3.00	\$ 4.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10 to 15"	1.50	2.30	3.40	5.00	\$ 7.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16 to 20"	2.10	2.90	4.00	5.50	7.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21 to 30"	3.30	4.10	5.20	6.80	9.10	\$12.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
31 to 42"	4.50	5.50	6.90	9.00	12.10	16.50	\$23.00	.....	.....	.....	.....	.....	.....	.....	.....
43 to 60"	6.00	7.40	9.30	12.00	15.80	21.00	29.00	.....	.....	.....	.....	.....	.....	.....	.....

The above list cancels list shown on page 370.

CAST IRON PULLEYS. Solid Pulleys for Single Belt.

Diameter, Inches	WIDTH OF FACE, INCHES											
	3	4	5	6	7	8	9	10	11	12		
6	\$2.20	\$2.50	\$2.85	\$3.20	\$3.60	\$4.05						
7	2.40	2.75	3.10	3.50	3.95	4.40						
8	2.65	3.00	3.40	3.80	4.25	4.75						
9	2.90	3.25	3.65	4.10	4.60	5.10						
10	3.10	3.50	3.95	4.40	4.90	5.45						
11	3.30	3.75	4.20	4.70	5.25	5.85						
12	3.60	4.05	4.55	5.10	5.70	6.30						
14	4.05	4.65	5.10	5.75	6.45	7.20	87.95					
16	4.65	5.20	5.80	6.50	7.30	8.20	9.20					
18	5.20	5.85	6.60	7.40	8.30	9.30	10.40					
20	5.75	6.65	7.55	8.50	9.45	10.45	11.55	\$12.70				
22	6.35	7.40	8.45	9.50	10.55	11.55	12.65	13.85				
24	7.05	8.20	9.35	10.50	11.65	12.80	14.00	15.20				
26	7.75	9.00	10.25	11.50	12.75	14.05	15.35	16.70				
28	8.55	9.95	11.35	12.75	14.15	15.55	17.00	18.50	\$20.10			
30	9.40	10.90	12.45	14.00	15.85	17.15	18.75	20.35	22.00			
36	12.40	14.20	16.05	18.00	20.05	22.10	24.15	26.20	28.30	\$30.45		
40	16.75	18.95	21.15	23.40	25.70	28.00	30.30	32.60	34.95	43.90		
48	22.40	25.05	27.75	30.45	33.20	35.95	38.75	41.60				
60												
72												

Solid Pulleys for Double Belt.

Diameter, Inches	WIDTH OF FACE, INCHES																	
	3	4	5	6	7	8	9	10	11	12	14	16	18	20	24	30	36	
6	\$2.50	\$2.80	\$3.15	\$3.60	\$4.10	\$4.55	\$5.05	\$5.65	\$6.05	\$6.55								
7	2.70	3.05	3.50	3.95	4.40	4.90	5.35	5.85	6.35	6.85								
8	2.90	3.35	3.80	4.25	4.75	5.25	5.80	6.35	6.95	7.60								
9	3.20	3.65	4.15	4.65	5.20	5.75	6.30	6.90	7.50	8.15								
10	3.45	3.95	4.45	5.00	5.55	6.15	6.80	7.50	8.20	8.95								
11	3.70	4.25	4.80	5.40	6.00	6.65	7.30	8.00	8.75	9.55								
12	3.95	4.55	5.15	5.80	6.45	7.15	7.85	8.60	9.35	10.15	\$11.75							
14	4.50	5.20	5.95	6.70	7.50	8.30	9.10	9.95	10.80	11.70	13.50							
16	5.10	5.80	6.60	7.45	8.30	9.20	10.10	11.05	12.00	13.00	15.00	\$17.20						
18	5.70	6.65	7.60	8.55	9.55	10.55	11.60	12.65	13.75	14.85	17.05	19.45						
20	6.40	7.45	8.55	9.65	10.80	11.95	13.15	14.40	15.65	16.95	19.45	22.15	\$24.95					
22	7.10	8.30	9.50	10.75	12.10	13.45	14.85	16.30	17.75	19.20	21.55	24.50	27.55	\$30.70				
24	7.90	9.25	10.60	12.00	13.45	14.90	16.40	17.90	19.40	20.90	24.00	27.25	30.60	34.05				
26	8.80	10.30	11.80	13.35	14.90	16.45	18.00	19.55	21.10	22.65	26.55	30.10	33.75	37.50				
28	9.80	11.45	13.10	14.75	16.40	18.05	19.70	21.35	23.00	24.65	29.20	33.05	36.90	40.95				
30	10.85	12.60	14.35	16.10	17.85	19.60	21.35	23.10	24.85	26.60	31.90	36.00	40.25	44.60				
36	14.30	16.55	18.85	21.15	23.45	25.75	28.05	30.35	32.65	34.95	40.70	45.85	51.10	56.45	\$67.40			
40	19.50	22.25	25.00	27.75	30.50	33.25	36.00	38.75	41.50	44.25	46.45	52.05	57.75	63.60	75.35			
48	26.10	29.40	32.70	36.00	39.30	42.60	45.90	49.20	52.50	55.80	60.00	67.00	74.10	81.30	95.95			
60	38.20	42.65	47.10	51.55	56.00	60.45	64.90	69.35	73.80	78.25	85.15	95.00	105.05	115.10	136.00			
72																		

Cast Iron Pulleys are not carried in stock but are made up to order only in our foundry and can be shipped promptly.
Cast Iron Pulleys are not returnable.

The above lists cancel lists shown on page 369.

"HELICOID" STEEL CONVEYOR.

For complete specifications see list on page 403

Diameter Inches	Price per Foot—	
	Black	Galvanized
4	\$1.40	\$1.90
6	2.00	2.70
8	2.50	3.50
9	2.50	3.50
10	3.00	4.20
12	3.50	5.00
14	5.00	7.00
16	6.25	8.75
18	Discontinued	

This price list cancels list shown on page 403

EXTRA HEAVY "HELICOID" STEEL CONVEYOR.

For complete specifications see list on page 403

Diameter Inches	Price Per Foot	
	4X	6X
6	\$2.50	3.00
8	3.00	3.50
9	4.75	5.50
12	5.50	6.00
14	7.00	8.50
16	8.50	

This price list cancels list shown on page 403

IMPERIAL FILES

WARRANTED EXTRA QUALITY. PERFECT IN TEMPER AND WORKMANSHIP.

H.Channon Company. Chicago.

CAST IRON PULLEYS. Split Pulleys for Single Belt.

Diameter, Inches	WIDTH OF FACE, INCHES										
	3	4	5	6	7	8	9	10	12	14	16
6.....	\$3.70	\$4.00	\$4.60	\$4.95	\$5.60	\$6.05	.....	.....	.....	.....	.....
7.....	3.90	4.25	4.85	5.25	5.95	6.40	.....	.....	.....	.....	.....
8.....	4.25	4.60	5.30	5.70	6.45	6.95	.....	.....	.....	.....	.....
9.....	4.50	4.85	5.55	6.00	6.80	7.30	.....	.....	.....	.....	.....
10.....	4.80	5.20	6.00	6.45	7.30	7.85	.....	.....	.....	.....	.....
11.....	5.00	5.45	6.25	6.75	7.65	8.25	.....	.....	.....	.....	.....
12.....	5.40	5.85	6.75	7.30	8.30	8.90	.....	.....	.....	.....	.....
14.....	6.00	6.60	7.50	8.15	9.30	10.05	\$11.30	.....	.....	.....	.....
16.....	6.75	7.30	8.40	9.10	10.40	11.30	12.85	.....	.....	.....	.....
18.....	7.45	7.60	9.40	10.20	11.70	12.65	14.35	.....	.....	.....	.....
20.....	8.20	9.10	10.60	11.55	13.10	14.10	15.85	\$17.00	.....	.....	.....
22.....	9.00	10.05	11.75	12.80	14.50	15.50	17.30	18.50	.....	.....	.....
24.....	9.85	11.00	12.90	14.05	15.90	17.05	19.00	20.20	.....	.....	.....
26.....	10.75	12.00	14.10	15.35	17.35	18.65	20.75	22.10	.....	.....	.....
28.....	11.80	13.20	15.50	16.90	19.10	20.50	22.80	24.30	.....	.....	.....
30.....	12.90	14.40	16.90	18.45	21.15	22.45	24.95	26.55	.....	.....	.....
36.....	16.80	18.60	21.55	23.50	26.55	28.60	31.70	33.75	\$39.05	.....	.....
40.....	.....	21.85	25.25	27.45	30.80	33.10	36.55	38.85	44.65	.....	.....
48.....	.....	29.05	33.10	35.80	39.80	42.55	46.65	49.45	55.95	.....	.....
54.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Split Pulleys for Double Belt.

Diameter, Inches	WIDTH OF FACE, INCHES													
	3	4	5	6	7	8	9	10	12	14	16	18	20	
8.....	\$4.50	\$4.95	\$5.70	\$6.15	\$6.95	\$7.45	\$8.35	\$8.90	\$10.50	.....	.....	.....	.....
9.....	4.80	5.25	6.05	6.55	7.40	7.95	8.85	9.45	11.05	.....	.....	.....	.....
10.....	5.15	5.65	6.50	7.05	7.95	8.55	9.60	10.30	12.15	.....	.....	.....	.....
11.....	5.40	5.95	6.85	7.65	8.40	9.05	10.10	10.80	12.75	.....	.....	.....	.....
12.....	5.75	6.40	7.35	8.00	9.05	9.75	10.90	11.65	13.65	\$15.75	.....	.....	.....
14.....	6.45	7.15	8.35	9.10	10.35	11.15	12.45	13.30	15.55	17.90	.....	.....	.....
16.....	7.20	7.90	9.20	10.05	11.60	12.30	13.75	14.70	17.20	19.80	\$22.65	.....	.....
18.....	7.95	8.90	10.40	11.35	12.90	13.90	15.55	16.60	19.40	22.25	25.30	.....	.....
20.....	8.85	9.90	11.60	12.70	14.45	15.60	17.45	18.65	21.80	25.10	28.50	\$32.05	.....
22.....	9.75	10.95	12.80	14.05	15.95	17.25	19.25	20.60	24.05	27.65	31.35	35.20	\$39.15	
24.....	10.70	12.05	14.15	15.55	17.65	19.10	21.30	22.80	26.60	30.55	34.60	38.80	43.10	
26.....	11.80	13.30	15.65	17.20	19.50	21.10	23.60	25.15	29.30	33.60	38.00	42.55	47.20	
28.....	13.05	14.65	17.25	18.95	21.45	23.20	25.80	27.60	32.10	36.75	41.50	46.30	51.30	
30.....	14.35	16.15	18.90	20.75	23.45	25.35	28.15	30.10	34.95	39.95	45.00	50.25	55.60	
36.....	18.70	20.95	24.40	26.65	30.00	32.35	35.80	38.25	44.25	50.40	56.65	63.05	69.55	
40.....	24.60	28.45	31.10	34.85	37.50	41.35	42.05	50.65	57.35	64.15	71.10	78.10	85.10	
48.....	32.75	37.45	40.80	45.45	48.80	53.55	57.95	65.15	73.15	81.85	90.40	99.05	107.85	
60.....	47.70	53.85	58.45	64.65	69.30	75.65	80.35	91.55	102.65	114.50	126.30	138.20	150.35	

The above lists cancel lists shown on page 370.

RIBBED COMPRESSION COUPLINGS.

For complete specifications see list on page

383.

Change list price on size 2 1/2 inches from

\$10.09 to \$10.00.

LIGHTNING SCREW PLATES.

Change list price page 424 as follows.

Catalog No.	Without Tap Wrench	With Tap Wrench
	\$14.50	\$15.25
192	15.75	16.75
194	23.25	24.25
198	42.75	48.75
200	.....	.....

For complete specifications see page 424.

GREEN RIVER SCREW PLATES. PAGE 426.

Size 116, Set No. 9. Change list price
from \$4.00 to \$40.00.

EXTRA PARTS FOR BAY STATE SCREW PLATES.

Change list price on 10 1/2 inch size from
\$1.00 to \$0.75 each. Page 430.

FOR THE AUTOMOBILE MANUFACTURER

We carry a full line of Auto Radiator Hose in 50 ft. lengths.

Send for a sample of our Special Auto Hose. Compare the qualities and prices,
and we are sure your next order will come to us. We can make prompt deliveries.

STERLING RIVETED ELEVATOR BUCKETS TIN MILL BUCKETS

Width on Belt, inches	Proje- ction, inches	Price Each	Width on Belt, inches	Proje- ction, inches	Price Each
2	2	\$0.08	4	3½	\$0.13
2½	2½	.08	4½	3½	.14
3	3	.09	5	4	.16
3½	3	.10	5½	4	.17
4	3	.12	6	4	.18

STEEL GRAIN BUCKETS

Width on Belt, inches	Proje- ction, inches	Price Each	Width on Belt, inches	Proje- ction, inches	Price Each
5	4	\$0.16	11	6	\$0.40
5½	4	.17	12	6	.44
6	4	.18	14	6	.50
7	4½	.22			
8	5	.25			
9	5	.28			
10	5½	.35			

For larger sizes see
"Warehouse" Buckets

HEAVY STEEL EAR CORN BUCKETS

Similar to the Steel Grain Buckets but made of much heavier materials.

Across Belt, inches	Projection, inches	No. of Bolt Holes	Capacity, Quarts	Price Each
7	5	3	1½	\$0.33
8	5½	3	2	.36
9	6	3	2½	.40
10	6	3	3	.44
11	7	4	3½	.56
12	7	4	4	.59
13	7	4	4½	.62
14	7	4	5	.65

For larger sizes see "Warehouse" Buckets

GALVANIZED STEEL BUCKETS

For Malt Houses, Breweries, Distilleries, etc. These buckets are galvanized after being made.

Width on Belt, inches	Projection, inches	Price Each
6	4	\$0.30
7	4½	.35
8	5	.40
9	5	.45
10	5½	.55
11	6	.60
12	6	.65
14	6	.70

The above lists cancel lists shown on page 397.

TAPPER TAPS

For Sizes Smaller than Shown Here, See List on Page 417.

Diameter Length of Thread	No. of Threads to Inch.				Whole Length, Price Each			
	U. S. Std. Reg.	U. S. Std. Furn.	V Stand- ard	Whit- worth Stand- ard	11 inch	12 inch	14 inch	15 inch
1½	4½	5½	5	5	\$6.10	\$6.30	\$6.50	\$6.65
1½	4½	5½	5	5	5.10	5.25	5.40	5.55
1½	4½	5½	5	5	6.70	7.00	7.20	7.40
1½	4½	5½	5	5	5.60	5.85	6.00	6.15
1½	4½	5½	5	5	7.80	8.00	8.25	8.35
1½	4½	5½	5	5	6.50	6.65	6.80	6.95
1½	4½	5½	5	5	8.70	8.90	9.05	9.25
1½	4½	5½	5	5	7.25	7.40	7.55	7.70

This list cancels list on page 417 of sizes shown here.

MACHINE OR NUT TAPS

Corrections in No. 50 Catalog, Machine or Nut Taps. Page 417.

Diameter, inches	Price Each	Number of Threads to inch				
		U. S. Std. Regu- lar	U. S. Threads Also Furn- ished	V Std. Regu- lar	V Threads Also Furn- ished	Whit- worth Regu- lar
1/16	\$ 0.60	40	27-32-36			
1/8	.60	40	24-27-32	24	32	24
1/8	.60	20	24-27-28	20	24	20
1/8	.70	18	20-24-27	18	16-20-24	18
1/8	.80	16	20-24-27	16	14-18	16
1/8	.90	14	20-27	14	12-16	14
1/8	1.00	13	12-20-27	12	13	12
1/8	1.15	12	18-27	12	14	12
1/8	1.30	11	18-27	11	10-12	11
1/8	1.45	11	16	11	12	11
1/8	1.60	10	16-27	10	12	10
1/8	1.80	10		10	12	10
1/8	2.10	9	14-27	9	10-12	9
1/8	2.40	9		9	12	9
1/8	3.15	8	14-27	8	12	8
1/8	3.40			8		
1/8	3.60	7		7	8	7
1/8	3.90			7		
1/8	4.25	7		7		7
1/8	4.50			7		
1/8	4.80	6		6		6
1/8	5.00			6		
1/8	5.65	6		6		6
1/8	6.50	5½		5		5
1/8	7.20	5		5		5
1/8	8.25	5		5		5
1/8	9.25	4½		4½		4½
1/8	10.80	4½		4½		4½
1/8	12.25	4½		4½		4½
1/8	13.80	4		4½		4
1/8	15.00	4		4		4
1/8	16.80	4		4		4
1/8	18.00	4		4		4
1/8	19.80	3½		3½		3½
1/8	21.60	3½		3½		3½
1/8	24.70	3½		3½		3½
1/8	26.85	3½		3½		3½
1/8	28.75	3½		3½		3½
1/8	31.25	3½		3½		3½
1/8	33.75	3		3		3
1/8	36.88	3		3		3
1/8	38.75	3		3		3
1/8	41.88	3		3		3

The above list cancels list shown on page 417.

MACHINISTS' HAND TAPS. PAGE 415.

Change list price on ¼ inch from \$3.70 to \$3.60 per set.

OSTER PATENT RATCHET DIE STOCK FOR PIPE. PAGE 433.

Size No. 11 discontinued.

THREE AND FOUR GROOVE DRILLS PAGE 439.

Size ½ inch. Change list price from \$5.05 to \$3.05 each.

DIAMOND HIGH SPEED TWIST DRILLS. Jobbers' Length No. 405.

Change list from price each to price per dozen. Page 444.

ROSE CHUCKING REAMERS. PAGE 452.

No. 120G (Taper Shanks).

Size $\frac{3}{4}$ inch. Change list price from \$3.20 to \$2.20 each.

METAL SLITTING SAWS

No.	Diam., inches	Thick-ness, inches	Hole, inches	Carbon Steel. Price Each	High Speed Steel. Price Each
G-50....	2 1/2	1/16	1	\$1.00	\$3.00
G-51....	2 1/2	1/16	1	1.00	2.90
G-52....	2 1/2	1/16	1	.90	2.85
G-53....	2 1/2	1/16	1	.90	2.85
G-54....	2 1/2	1/16	1	1.10	3.10
G-55....	3	1/16	1	1.25	3.45
G-56....	3	1/16	1	1.10	3.10
G-57....	3	1/16	1	1.00	3.00
G-58....	3	1/16	1	1.00	3.00
G-59....	3	1/16	1	1.00	3.00
G-60....	3	1/16	1	1.00	3.00
G-61....	3	1/16	1	1.15	3.25
G-62....	4	1/16	1	2.25	5.10
G-63....	4	1/16	1	1.45	3.65
G-64....	4	1/16	1	1.25	3.45
G-65....	4	1/16	1	1.20	3.35
G-66....	4	1/16	1	1.20	3.35
G-67....	4	1/16	1	1.40	3.95
G-68....	4	1/16	1	1.60	3.95
G-69....	5	1/16	1	1.80	4.35
G-70....	5	1/16	1	1.60	3.85
G-71....	5	1/16	1	1.50	3.85
G-72....	5	1/16	1	1.50	3.85
G-73....	5	1/16	1	1.90	4.80
G-74....	5	1/16	1	2.30	4.80
G-75....	5	1/16	1	4.00	8.00
G-76....	6	1/16	1	3.00	6.35
G-77....	6	1/16	1	2.70	5.85
G-78....	6	1/16	1	3.50	6.95
G-79....	6	1/16	1	3.50	6.95
G-80....	6	1/16	1	3.50	6.95
G-81....	7	1/16	1	7.50	.....
G-82....	7	1/16	1	4.50	.....
G-83....	7	1/16	1	3.80	7.70
G-84....	8	1/16	1	6.75	.....

The above lists cancel lists shown on page 465.

MICROMETER CALIPER SETS

No. in Set	Capacity	Without Ratchet Stop	With Ratchet Stop
3	0 to 3 inches	\$16.50	\$18.00
6	0 to 6 inches	38.00	41.00

Correcting error in heading, page 463, Catalog No. 50.

MICROMETER CALIPERS NOS. 83-86

English or Metric Measure

No.	Range	Measure-ment by	Price With- out Ratchet Stop	Price With Ratchet Stop
83	2 in. to 3 in.	1000ths	\$6.00	\$6.50
84	3 in. to 4 in.	1000ths	6.50	7.00
85	4 in. to 5 in.	1000ths	7.25	7.75
86	5 in. to 6 in.	1000ths	8.00	8.50

These calipers are also made to read to hundredths of a millimeter. Standard for adjusting furnished with each caliper.

The above list corrects list shown on page 469.

STARRETT'S NO. 193 PROTRACTOR.

PAGE 489.

Price, each.....\$1.50

TOOLMAKERS' PARALLEL CLAMPS.

NO. 161. PAGE 490.

No. 161C. Change list price from \$1.00 to \$1.75 per pair.

STARRETT'S No. 46 DEPTH GAUGE.

	Price Each
46A with $3\frac{1}{2}$ in. stock and 4 in. scale.....	\$1.25
46C with 6 in. stock and 4 in. scale.....	1.50
46D with 6 in. stock and 6 in. scale.....	1.75
46E with 10 in. stock and 6 in. scale.....	2.25

The above list corrects list shown on page 490.

Additional line Cold Chisels to those shown on page 502.

SHARPEN EZY COLD CHISELS.

Width Blade Inches	Price Each	Price Per Dozen
$\frac{1}{2}$	\$0.20	\$1.75
$\frac{3}{4}$	.25	2.25
$\frac{1}{2}$	.35	3.25
$\frac{3}{4}$	.50	4.75
$\frac{1}{2}$	.70	6.75
$\frac{3}{4}$	.90	8.75
Assorted	.....	4.00

SCREW DRIVER BITS.

Forged Steel.

Size, inches.....	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Per dozen.....	\$2.00	\$2.15	\$2.25	\$2.40

The above list corrects list shown on page 503

REAMER BITS.

No.	Kind	Price Each	Price Dozen
8	Square	\$0.40	\$3.75
10	Octagon	.40	4.00
9	Half Round	Discontinued.	

This list cancels list on page 503.

PERFECT HANDLE DRAW KNIFE.

Size, inches.....	8	10	12
Price each.....	\$1.60	\$1.80	\$2.00
Price per dozen.....	16.00	18.00	20.00

This list cancels list shown on page 505

BRASS AND IRON PLUMB BOBS

Iron, Japanned

No.	Weight	Each	Dozen
1	9 1/2 oz.	\$0.15	\$1.15
1 1/2	18 oz.	.25	2.15
1 1/2	1 1/2 lbs.	.30	2.75
5	2 1/2 lbs.	.35	3.00

The above list cancels list shown on page 503.

STEEL SQUARES Extra Quality and Finish

No.	Body, inches	Tongue, inches	Face	Each	Dozen
1	24 x 2	16 x 1 1/2	1/8 x 1 1/2	\$1.80	\$18.00
3	24 x 2	16 x 1 1/2	1/16 x 1 1/2	1.50	15.00
3-B	24 x 2	16 x 1 1/2	1/16 x 1 1/2	2.00	20.00
14	24 x 2	16 x 1 1/2	1/8 x 1 1/2	1.30	12.75
12	12 x 1 1/2	18 x 1	1/8 x 1 1/2	1.15	11.25

No. 1. For Drafting, Extra Quality and Finish.

No. 3. Polished Steel, Satin Finish.

No. 3-B. Oxidized Coppered, Black, with White Markings, very well adapted for Carpenters.

No. 14. Eagle, Board and Brace Measure.

No. 12. Very Fine Quality, note size.

The above list cancels list shown on page 503.

SOCKET FRAMING CHISELS 8-inch Blades, Ring Handles

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
1	\$0.90	\$9.00	1	\$1.10	\$11.00
1 1/2	0.90	9.00	1 1/2	1.20	12.00
2	0.90	9.00	1 3/4	1.20	12.00
2 1/2	0.95	9.50	2	1.30	13.00
3	1.00	10.00	2 1/2	1.45	14.50
3 1/2	1.05	10.50	3	1.60	16.00

The above list cancels list shown on page 505.

CARPENTERS' SLICKS

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
2 1/2	\$2.10	\$21.00	3 1/2	\$2.75	\$27.50
3	2.35	23.50	4	3.20	32.00
3 1/2	2.35	23.50			

The above list cancels list shown on page 505.

SOCKET FIRMER GOUGES

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
1	\$0.95	\$9.50	1 1/2	\$1.20	\$12.00
1 1/2	0.95	9.50	1 3/4	1.30	12.75
2	0.95	9.50	2	1.45	14.25
2 1/2	1.00	10.00	2 1/2	1.60	16.00
3	1.05	10.50	3	1.75	17.50
3 1/2	1.15	11.25	3 1/2	2.00	20.00

The above list cancels list shown on page 505.

CAREW'S PATENT WIRE CUTTER.

PAGE 521.

Six-inch size discontinued.

SOCKET FIRMER CHISELS Leather Tipped Handles

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
1	\$1.40	\$14.00	1 1/2	\$1.85	\$18.50
1 1/2	1.40	14.00	2	2.05	20.50
2	1.40	14.00	2 1/2	2.05	20.50
2 1/2	1.40	14.00	3	2.20	22.00
3	1.55	15.50	3 1/2	2.40	24.00
3 1/2	1.60	16.00	4	2.50	25.00
4	1.80	18.00			

For Bevel Edge add 75c per Dozen NET EXTRA

Assorted in Sets. Plain Boxes PRICE PER SET

6 Chisels, 1 1/2, 1 1/2, 1 1/2, 2, 2, 2	\$ 9.30
8 " 1 1/2, 1 1/2, 1 1/2, 1 1/2, 2, 2, 2, 2	12.30
9 " 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2	12.75
12 " 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2	18.50

The above lists cancel lists shown on page 505.

DRAW KNIVES Carpenters' Razor Blade

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
6	\$1.35	\$13.50	11	\$1.80	\$18.00
7	1.35	13.50	12	1.80	18.00
8	1.35	13.50	13	2.10	21.00
9	1.45	14.40	14	2.10	21.00
10	1.55	15.60	16	2.40	24.00

WITH FOLDING HANDLES Discontinued

The above list cancels list shown on page 505.

TANGED TURNING CHISELS

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
1	\$0.35	\$3.25	1 1/2	\$0.50	\$5.00
1 1/2	0.35	3.25	2	0.60	5.75
2	0.35	3.25	2 1/2	0.75	7.25
2 1/2	0.40	3.60	3	0.95	9.25
3	0.40	4.00	3 1/2	1.15	11.25
3 1/2	0.45	4.50	4	1.35	13.25

The above list cancels list shown on page 505.

TANGED TURNING GOUGES

Size, inches	Price Each	Price per Dozen	Size, inches	Price Each	Price per Dozen
1	\$0.45	\$4.25	1 1/2	\$0.70	\$7.00
1 1/2	0.45	4.25	2	0.80	8.00
2	0.45	4.25	2 1/2	1.00	10.00
2 1/2	0.50	4.75	3	1.30	13.00
3	0.55	5.25	3 1/2	1.60	15.50
3 1/2	0.60	6.00	4	1.90	19.00

The above list cancels list shown on page 505.

H.Channon Company. Chicago.

P. S. & W. SAMSON RATCHET BRACE. Ball Bearing.

No.	Sweep, Inches	Price Each	Dozen
3200	14	\$5.00	\$59.00
3201	12	5.55	55.50
3202	10	5.20	52.00
3203	8	4.85	48.50
3204	6	4.85	48.50

This list cancels list shown on page 509.

BERNARD PATENT PLIERS.

Open Throat, Parallel Jaws, Full Nickel
Plated, Made of Crucible Steel.

PRICES OF Nos. 100 AND 101.

Size, Inches	Price, Each	Price, per Doz.
4½	\$0.60	\$ 6.00
5	.70	7.00
5½	.80	8.00
6	.90	9.00
6½	1.00	10.00
7	1.10	11.00
8	1.40	14.00

No. 102 CUTTING PLIERS.

Size, Inches	Price, Each	Price, per Doz.
4½	\$1.15	\$11.50
5	1.30	13.00
5½	1.45	14.50
6	1.60	16.00
6½	1.75	17.50
7	1.90	19.00
8	2.35	23.50

The above lists cancel lists shown on page 522.

"CAROLUS" NUT SPLITTER AND BOLT CLIPPER.

Size No. 2-N. Change list price from \$9.00
to \$8.00. Page 523.

SPRING HAND VISES.

With Bright Steel Jaws.

Change list price on 5-inch length to dozen,
\$8.60. Each, \$0.85. Page 524.

"BULLOCK" BENCH AND MACHINISTS' VISES Stationary Base

SWIVEL JAWS

No.	Width Jaw, Inches	Open, Inches	Weight, lbs.	Price Each
81	3½ in.	5 in.	30 lbs.	\$7.00
82	4 in.	6½ in.	48 lbs.	9.00
83	4½ in.	7½ in.	58 lbs.	10.50
84	5 in.	7½ in.	78 lbs.	14.00
85	5½ in.	9 in.	110 lbs.	17.00
86	6 in.	10 in.	146 lbs.	24.00
87	7 in.	12 in.	195 lbs.	30.00

This list cancels list shown on page 525.

"VULCAN" CHAIN PIPE VISE.

Change "holds pipe" ½ to 2½ inches to
½ to 4 inches. Page 529.

MALLEABLE HINGED PIPE VISE.

For complete specifications and price list see list
on page 530.

No.	Weight, Lbs.
0	5
1	14
2	19
3	21½
4	45

This list corrects list on page 530.

RAWHIDE MAULS

No.	Weight, Lbs.	Price, Each
1	3	\$1.80
2	4	2.10
3	6	2.40
4	8	2.75
5	10	3.00
6	12	3.25

The above list cancels list shown on page 533.

W. & B. COMBINATION WRENCH.

For complete specifications see list on page 537.

Length Inches	Price— Per Dozen	Each
10	\$23.00	\$2.30
12	26.00	2.60
15	37.00	3.70

This price list cancels list shown on page 537.

BILLINGS' POCKET WRENCHES.

Change price on Model "C" as follows:

	Black	Nickel
Each.....	\$1.00	\$1.10
Dozen.....	10.00	11.00

This price list corrects list shown on page 540.

DOUBLE-HEAD "S" WRENCH.

No.	Size of Opening	Thick- ness of Heads	Length Over All	Price Unfin- ished	Price Semi- Fin- ished	Price Fin- ished
220	1 x 1½	1½	4	.13	.20	.26
221	1½ x 1½	1½	5	.17	.26	.34
222	2 x 1½	1½	6	.22	.33	.44
223	2½ x 1½	1½	7	.25	.38	.50
224	1 x 1½	1½	8	.30	.45	.60
225	1½ x 1½	1½	9	.36	.54	.72

This list cancels list shown on page 542.

For Hard Service Use AJAX ROPE. "Strong, Safe and Economical."

Additional Line of Chain Pipe Wrenches as Shown on Page 547.

VULCAN "BIJAW" CHAIN PIPE WRENCHES

With Double-ended Reversible Jaws for Pipe, Pipe Fittings, Bolts, Bars, Shafts, etc., from $\frac{1}{8}$ " to 12" Diameter

The "Vulcan" and "Vulcan Bijaw" pipe wrenches are alike in their superior conditions of manufacture; all parts are made of wrought steel, are interchangeable and absolutely guaranteed. Flat, hand made chain is of great strength and the jaws are tempered for file sharpening. The utility of tools is doubled and abundant strength and safety are preserved without encumbering design or adding extra weight.

Commendable Features

Central swing of chain—tool is always "right side up."

Guaranteed strength—will exceed printed tests; see table.*

Reversible jaws—insure double life and an "always ready" tool; you get service of two or four tools at cost of one.

No spreading of jaws when at work—jaws are fastened with two bolts and nuts, which if injured may be quickly replaced by bolts from any hardware store. Nuts are readily released when reversing jaws.

A BITE EVERYWHERE

Number	30	31	32	33	33½	34	35
Capacity Size Pipe.....	$\frac{1}{4}$ to $\frac{1}{2}$ in.	$\frac{1}{2}$ to $\frac{3}{4}$ in.	$\frac{3}{4}$ to 2 in.	1 to 4 in.	1 to 6 in.	1½ to 8 in.	2 to 12 in.
Price each with Flat Link Chain.....	\$2.50	\$3.50	\$5.00	\$7.00	\$9.00	\$11.00	\$18.00
Price each with Cable Chain.....	\$2.25	\$3.25	\$4.50	\$6.25	\$7.75	\$9.50	\$16.00
Extreme Length.....	13½ in.	20 in.	27 in.	37 in.	44½ in.	50½ in.	64½ in.
Weight.....	1½ lbs.	5½ lbs.	10 lbs.	16 lbs.	24 lbs.	31 lbs.	50 lbs.
Extra Jaws, pair.....	\$1.00	\$1.75	\$2.75	\$4.00	\$4.75	\$5.50	\$7.50
Extra Flat Link Chain, each.....	\$0.75	\$1.00	\$1.50	\$2.50	\$3.25	\$4.00	\$6.00
Breaking Strain, pounds.....	3,600	6,700	9,800	12,500	14,300	15,700	21,800
Extra Cable Chain, each.....	\$0.50	\$0.75	\$1.00	\$1.75	\$2.00	\$2.50	\$4.00
Size Iron.....	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.
Breaking Strain, pounds.....	1,200	4,000	6,000	10,500	12,500	15,000	19,000

HEXAGON BOX WRENCHES

15, 7° ANGLE, SINGLE HEAD

The small outside diameter of the head makes these wrenches efficient in corners and other places where the clearance is limited.

No.	For U.S. Standard Nuts, Size, Bolt, in.	Extreme Length, inches	Outside Diam. Head, inches	Price Each		
				Unfinished	Semi-Finished	Finished
W-801	$\frac{1}{4}$	4	1½	\$0.10	\$0.15	\$0.20
W-802	$\frac{1}{2}$	4½	1½	.12	.18	.24
W-803	$\frac{3}{4}$	5	1½	.14	.21	.28
W-804	$\frac{1}{2}$	6	1½	.17	.25	.34
W-805	$\frac{3}{4}$	7	1½	.20	.30	.40
W-806	$\frac{1}{2}$	8	1½	.26	.39	.52
W-807	$\frac{3}{4}$	9	1½	.32	.48	.64
W-808	$\frac{1}{2}$	11	2	.42	.63	.84
W-809	$\frac{3}{4}$	13	2½	.58	.87	1.16
W-810	1	15	2½	.75	1.13	1.50
W-811	$\frac{1}{2}$	17	2½	1.00	1.50	2.00
W-812	$\frac{3}{4}$	19	3½	1.25	1.88	2.50
W-813	$\frac{1}{2}$	21	3½	1.62	2.43	3.24
W-814	$\frac{3}{4}$	23	3½	2.00	3.00	4.00
W-815	1	25	4	2.50	3.75	5.00
W-816	$\frac{1}{2}$	27	4½	3.00	4.50	6.00

This list cancels list shown on page 540.

Additional line of Adjustable Wrenches to those shown on page 546.

WESTCOTT ADJUSTABLE "S" WRENCH.



Length, Inches	Opens, Inches	Price, Each	Price, per Dozen
8	1	\$0.70	\$ 7.20
10	1½	.90	9.00
12	1¾	1.20	12.00
14	2	1.50	15.00
		2.10	21.00

JACOB'S DRILL CHUCKS

No.	Capacity, inches	Price, Each	Prices—Extra Parts		
			Sleeves	Jaws	Wrenches
1	0 to $\frac{1}{2}$	\$5.50	\$0.55	\$0.55	\$0.30
2	0 to $\frac{3}{4}$	5.50	.55	.55	.30
3	0 to 1	9.00	.90	.90	.45
4	0 to 1½	18.00	1.50	1.50	.75
5	$\frac{1}{2}$ to 1	25.00	2.25	2.25	1.25

This list cancels list shown on page 554.

Additional Line of Drill Chucks as Shown on Pages 554 and 555.

ALMOND DRILL CHUCKS



The gear teeth are cut on the split ring or nut (operating jaws) made of perfectly hardened and tempered tool steel. Each pinion hole is fortified with a hardened steel bushing, preventing it from becoming large or out of round and maintaining alignment of the pinion with the gear. The Pinion furnished is made from high grade tool steel, providing the necessary long life and wearing qualities. Replacements are unnecessary. The No. 1 or 3/16" size is intended only for very light and delicate work and is not made in the



geared pattern; it grips the tool when tightened by hand with sufficient strength for any reasonable requirements; other than the hand no tightening method is necessary. A geared Chuck, having teeth on the knurled sleeve, is dependent upon friction between the nut and knurled sleeve to drive the nut when tightening or loosening. Such a Chuck after being taken apart several times for cleaning depreciates greatly in value to the user, because the ferrule becomes stretched from being forced on and off and is liable to slip on the nut.

No.	Capacity, inches	Price, Each	EXTRA PARTS				
			Ferrules	Nuts	Spanners	*Jaws	Arbors
1	$\frac{1}{8}$ "-0	\$5.50	\$0.50	\$0.50	.....	\$0.50	1 and 2 Morse Taper.....\$1.50
2	$\frac{3}{16}$ "-0	5.50	.50	.50	\$0.12	.50	1, 2 and 3 Morse Taper.....1.50
3	$\frac{1}{4}$ "-0	9.00	.65	.65	18	.90	1, 2 and 3 Morse Taper.....2.00

In ordering jaws give number found on back end of jaw.

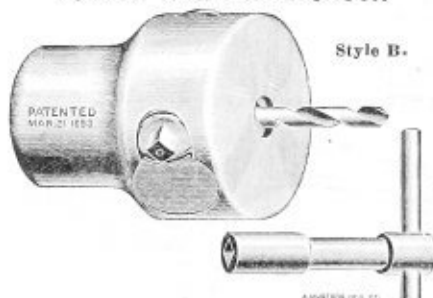
We furnish only a ground arbor, almond taper one end, Morse taper other end.

Geared chuck not furnished in No. 1 size.

Pinions (one size for both sizes of chuck).....\$1.00

Additional Line of Drill Chucks as Shown on Pages 554-555.

HORTON NEW DRILL CHUCK



Simple in construction, strong and durable; body composed of one piece metal; entire chuck of but four pieces.

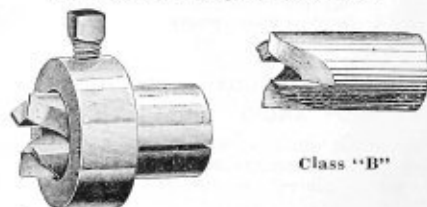
Six sizes, 1/4" to 2".

No.	Approximate Diam. of Body	Will hold Drill	Price
0	1/2 inch	0 to 1/2 inch	\$ 7.00
1	1 1/2 inch	0 to 1 inch	7.50
2	2 1/2 inch	0 to 1 1/2 inch	8.00
3	2 1/2 inch	0 to 1 1/2 inch	9.00
4	3 1/2 inch	0 to 1 inch	10.00
5	5 1/2 inch	0 to 1 1/2 inch	18.00
6	6 1/2 inch	0 to 2 inch	20.00

N. B. These chucks are designated by the size drill they will hold, or by numbers above.

LATHE OR HOLLOW MILLS

Omitted from page 556, Cat. 50.



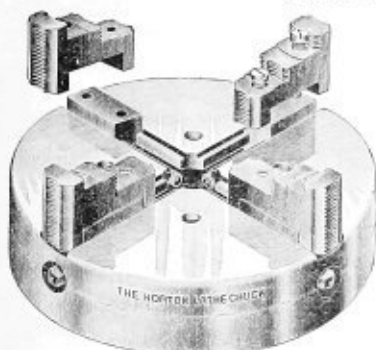
Class "A"—Adjustable

Class "B"

Size Hole	Outside Diameter	Length inches	Price Each	
			Class "A"	Class "B"
1/8"	1 1/8"	1 1/2"	\$1.60	\$1.00
1/4"	1 1/4"	1 1/2"	1.60	1.00
3/8"	1 3/8"	1 1/2"	1.60	1.00
1/2"	1 1/2"	1 1/2"	1.60	1.00
5/8"	1 5/8"	1 1/2"	1.60	1.00
3/4"	1 3/4"	1 1/2"	1.60	1.00
7/8"	1 7/8"	1 1/2"	1.80	1.50
1"	2"	1 1/2"	1.80	1.50
1 1/8"	2 1/8"	1 1/2"	2.00	1.50
1 1/4"	2 1/4"	1 1/2"	2.00	2.00
1 1/2"	2 1/2"	1 1/2"	2.20	2.00
1 3/4"	2 3/4"	1 1/2"	2.40	2.00
2"	3"	1 1/2"	2.60	2.00
2 1/8"	3 1/8"	1 1/2"	2.80	2.50
2 1/4"	3 1/4"	1 1/2"	3.00	2.50
2 1/2"	3 1/2"	1 1/2"	3.40	2.50
2 3/4"	3 3/4"	1 1/2"	3.80	2.50

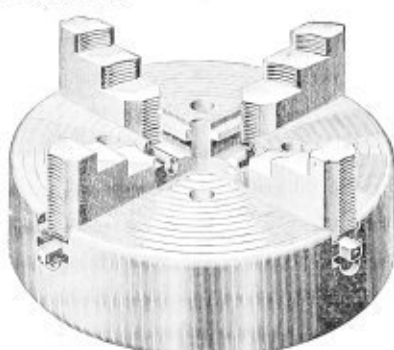
Additional Line of Lathe Chucks to Those Shown on Pages 550 and 551.

HORTON LATHE CHUCKS



Three or Four Jaw Combination Chuck
Reversible Jaws

The construction of Horton Reversible Jaws is superior to that of other makes in that entire face of Jaw is reversed, thus making the wear even. The parts are accurately fitted so that end thrust is not on the screws.



Improved Independent Chuck
Reversible Jaws

3 or 4 Jaw Combination Chuck.

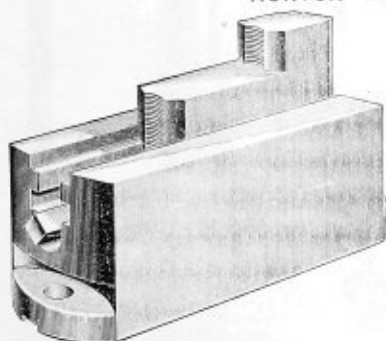
Size of Chuck, inches	Price Each 3 Jaws	Price Each 4 Jaws	Size of Chuck, inches	Price Each 3 Jaws	Price Each 4 Jaws
5	\$25.00	\$30.00	22	\$ 90.00	\$110.00
6	26.00	32.00	24	100.00	120.00
9	34.00	42.00	26	130.00	160.00
12	44.00	56.00	30	170.00	200.00
15	52.00	64.00	36	230.00	285.00
18	62.00	75.00	42	270.00	325.00
21	80.00	95.00			

Improved Independent Chuck

Size Chuck, inches	Weight, lbs.	Diam. Hole Through Center, inches	Diam. Recess for Face Plate, inches	Price Each	Size Chuck, inches	Weight, lbs.	Diam. Hole Through Center, inches	Diam. Recess for Face Plate, inches	Price Each
4	6	1	3	\$14.00	22	216	4 1/2	9 1/2	\$ 57.00
6	13	1 1/2	3 1/2	18.00	24	254	4 1/2	9 1/2	65.00
8	26	1 1/2	4 1/2	22.00	26	340	5 1/2	13	80.00
9	30	2	4 1/2	24.00	28	373	5 1/2	13	100.00
10	37	2	4 1/2	26.00	30	454	6	15	120.00
12	65	3	6 1/2	30.00	32	463	6 1/2	15	150.00
14	84	3	6 1/2	34.00	34	503	6 1/2	15	180.00
15	100	3	6 1/2	38.00	36	520	6 1/2	18	210.00
16	114	3	6 1/2	38.00	38	595	7 1/2	18	240.00
18	143	4	7 1/2	44.00	40	609	7 1/2	18	270.00
20	191	4	7 1/2	50.00	42	625	7 1/2	18	300.00

HORTON REVERSIBLE FACE PLATE JAWS

Four of these bolted to the face-plate of a lathe, or to the table of a boring mill, etc., make a good substitute for a large Independent Chuck.



Nominal Size, inches.	Length of Body, inches.	Length over all, inches.	Height of Body, inches.	Weight, lbs.	Price per Set of Three.	Price per Set of Four.
8	8	10 1/2	4 1/2	40	\$ 45.00	\$ 60.00
10	10	13	4 1/2	58	60.00	80.00
12	12	15	4 1/2	80	90.00	120.00
14	13 1/2	16	4 1/2	100	120.00	160.00

H.Channon Company. Chicago.

Additional Line of Drill Chucks to Those Shown on Pages 554-555.

THE WIZARD QUICK CHANGE DRILL CHUCK.

The use of all sizes and shapes of both regular and special tools, in rapid succession, made possible with this chuck without stopping the machine.

Machined from best steel, hardened and ground inside and out. This means a tool practically perfect and indestructible, and it means no sparing of expense to make the Wizard as superior in workmanship as it is in principle of construction.

Absolutely the only chuck and collets that hold the tool rigid and perfectly centered without any looseness or "play." If it is desired to "float" the tool as in the case of taps or reamers, this can be done by fitting the taps floatingly in the collets. Thus a tool can either be held rigid or floated as desired. In either case it is perfectly centered. The only quick-change chuck whose collets are regularly furnished with a positive drive for Morse taper shanks, which absolutely ends all tang troubles. Manipulates easier at high speed. Collets are the only ones provided with a ring or flange to serve as a shoulder against the hand in pushing the tool up into the chuck and in catching it when released. The cone-shaped taper on the upper end of the collets not only helps to hold the tool rigid and centers it, but also makes it much easier to get the collet started into the chuck. This taper is absolutely unique with the Wizard.

The "Drive" is direct and very powerful. The Wizard drives backward as well as forward, and is also finely adapted for back facing.

The operation is instantaneous and exceedingly simple. A slight resistance to the outside collar with the hand while the spindle is in motion overcomes the tension of the spiral spring within and throws the key slot in the chuck open so that the collet will either fall out or slip into the slot. The spring then throws the collar back to closed position, closing the key slot and securely locking the collet in place. Thus a touch to the collar releases one tool and another tool is inserted with another touch. The motion of the spindle itself does the work.

Wizard Collets drop-forged from best steel, machined, hardened and ground. The whole collet is one solid piece of steel.

Blank Collets are not hardened and may easily be bored to receive the straight shanks of drills, taps, reamers, etc. An ordinary mechanic can fit up a score of tools with such collets in a half day's time. Blank collets are sent 5-1000 over size so that they may be hardened and ground after being fitted to the shank. There are numerous ways of "driving" straight shanks in such collets, and printed instructions explaining different methods are sent with each shipment.

The Famous Lang Drive as applied to Wizard Collets ends all tang troubles on new drills, and also makes old drills with broken tangs as good as new. Simply grind a flat on shank. The hardened steel key is pressed into socket and imbedded three-fourths its diameter in the shell, which is made extra thick.



Size	Chuck Shank	Maximum Range of Collet	Price Each
A	Morse 2 or 3	Morse 2, or straight shank 11-16"	\$ 6.50
B	Morse 3 or 4	Morse 3, or straight shank 1"	8.00
C	Morse 4 or 5	Morse 4, or straight shank 17-16"	12.85

COLLETS.

Description	For Chuck Size A	For Chuck Size B	For Chuck Size C
Blank, to be bored for straight shank.	\$1.00	\$1.20	\$2.00
Furnished with Morse hole No. 1.....	1.60	1.80	2.80
Furnished with Morse hole No. 2.....	1.75	1.90	3.00
Furnished with Morse hole No. 3.....	...	2.10	3.20
Furnished with Morse hole No. 4.....	...	...	3.50
Fitted for straight shank.....	1.60	1.90	3.00

Morse Taper Collets furnished with Lang Drive take net list prices.

Wizard Collets can also be furnished with the Lancaster oval hole for oval shank tools. Prices on application.

BLANK COLLET
To be fitted for straight or special shanks.



WIZARD COLLET.
Fitted for Morse Taper Shank.



ADDITIONAL LINE OF CHUCKS, No. 50 CATALOG.

Chucks With Drill Points for Yankee Screw Drivers Nos. 20, 30 and 31.



The outside of Chuck corresponds to Bit of Driver in size, the inside to shank of Drill Points used in "Yankee" Automatic Drills. The drill point is first put in chuck as in illustration, and the two together put in chuck of Spiral Driver the same as ordinary bit. The Spiral Driver is set for right hand and drill revolved by pushing down on handle or by ratchet movement, same as driving in screws.

For Nos. 30, 31 and 20 size 2 and 3 eight drill points $\frac{1}{8}$ to 11-64, inclusive, as shown in illustration, one furnished with chuck; for 20 size 1 only three drill points, $\frac{1}{8}$ to $\frac{3}{8}$, are furnished with Chuck. The sets are packed in round wooden boxes.

Packed one dozen in paper box.

Price, each\$0.75

BORING TOOLS

For use in large lathes with clamp tool rest. Consists of shank and bar with straight and 45 degree end caps, two cutters and double end wrench.

No.	Size Shank, inches	Diameter Bar, inches	Length Bar, inches	Size Cutter, in. sq.	Price Complete	Extra Cutters Ground for Boring, Each
112	1 1/8 x 2 1/2	1 1/8	18	7/16	\$ 8.00	\$0.40
113	1 3/8 x 2 3/4	1 3/8	22	1/2	10.50	.50
114	2 1/8 x 3 1/4	1 1/2	24	3/4	13.75	.70

This list cancels list shown on page 559.

PATTERN MAKERS' SHRINKAGE RULES.

Change:	Extreme Length, Inches	Shrinkage per Foot, Inches
On No. 8206 to.....	24 2-12	1-12
On No. 8207 to.....	24 2-10	1-10

PAGE 583.

DROP FORGED DOUBLE SCREW LATHE DOG

With Straight or Bent Tail

Specially designed for heavy work.

Size, inches	Weight, lbs.	Price Each	
		Straight Tail	Bent Tail
5	25	\$ 9.00	\$ 9.00
6	35	14.00	14.00

Screws used in both sizes, 1 in. dia., 6 in. long.

Each\$0.75

This list cancels list shown on page 570.

THE PEERLESS ADJUSTABLE CLAMPS.

No.	Length Jaw, Inches	Opens, Inches	Price, per Doz.	Price, Each
0	7 1/2	4	\$ 6.60	\$0.70
1	9 1/2	6	7.80	.80
2	11 1/2	8	8.70	.90
3	14	10	9.60	1.00
4	16	12	11.40	1.25
5	18	14	13.20	1.50

This list cancels list shown on page 571.

STATIONARY TRUCK CASTERS

Additional Line as Shown on Page 579

These Casters to Be Used with the Single-Wheel Swivel Casters

No.	Wheel	Base	Height	Corresponds to Truck Caster	Price per Set of Four
8	2 1/2 x 1 1/2	4 1/2 x 2	3 1/2	188	\$ 2.35
10	3 1/2 x 1 1/2	5 x 2 1/2	4 1/2	190	3.05
108	4 1/2 x 1 1/2	5 x 2 1/2	5	.....	3.45
11	5 x 1 1/2	6 1/2 x 2 1/2	6	192	7.50
12	5 x 1 1/2	7 1/2 x 2 1/2	6	192	10.00

These Casters to Be Used with the Double-Wheel Swivel Casters

241	2 1/2 x 1 1/2	3 x 4 1/2	2 1/2	62	2.25
242	2 1/2 x 1 1/2	3 x 4 1/2	3 1/2	72	2.60
243	3 1/2 x 1 1/2	3 x 4 1/2	3 1/2	82	3.00
244	3 1/2 x 1 1/2	3 1/2 x 4 1/2	4 1/2	102	3.40
245	4 1/2 x 1 1/2	3 1/2 x 5 1/2	4 1/2	112	5.50
246	5 1/2 x 1 1/2	3 1/2 x 7	5 1/2	122	8.25
247	5 1/2 x 1 1/2	4 1/2 x 7	6	142	10.45

Additional line of Emery Paper to that shown on page 591.

Emery, in bulk.

Best Turkish:		
Nos. 4 to 46 keg lots.....	cwt.	\$4.25
Broken lots.....	lb.	.07 1/2
Nos. 54 to 200 keg lots.....	cwt.	4.50
Broken lots.....	lb.	.07 1/2
Flour:		
Keg lots.....	cwt.	4.00
Broken lots.....	lb.	.07
Packed as follows:		
Full kegs, about 250 lbs.		
Quarter kegs, about 100 lbs.		

H.Channon Company. Chicago.

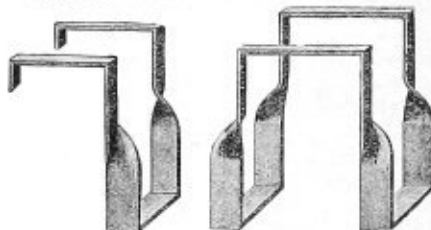
EMERY PAPER

IN SHEETS 9 x 11 INCHES					IN ROLLS 50 YARDS LONG		
No.	Size of Original Packages	Number of Reams in a Bundle	Price Per Quire	Price per Ream	Size	Furnished in 24-inch Width Only	Price per Roll
3-0 to 0	1 Ream	5	\$0.65	\$10.25	3-0 to 1		\$11.00
1	1 Ream	3 1/2	.65	10.25	1		12.75
1 1/2	1 Ream	3	.75	12.00	1 1/2		13.25
2	1 Ream	2 1/2	.80	12.75	2		13.75
2 1/2	1 Ream	2	.85	13.50	2 1/2		15.75
3	1 Ream	1 1/2	1.00	15.50	3		19.25
3 1/2	1 Ream	1 1/2	1.15	18.25	3 1/2		22.00
4	1 Ream	1	1.35	21.25			
Assorted	1 Ream	4		12.75			

The above lists cancel lists shown on page 591.

SINGLE AND DOUBLE STIRRUPS

Made of steel bars heated to a uniform heat, bent and left to cool. This process leaves them soft and elastic.



In giving size of stirrup, start at bottom, go up, then over, i. e., if your joist is 6x12 inches and you desire to have 9 inch girder bearing, your order would read 6x12 x9 inches.

Sizes	2x1	2x1	2 1/2x1	3x1	Sizes	2x1	2x1	2 1/2x1	3x1
2x 8x2	\$0.40	\$0.44	\$0.43	\$0.46	3x12x9	\$0.72	\$0.85	\$0.84	\$0.86
2x 8x4	.44	.52	.51	.54	3x14x3	.60	.73	.72	.74
2x10x2	.44	.62	.51	.54	3x14x6	.68	.81	.80	.82
2x10x4	.50	.58	.57	.60	3x14x9	.78	.91	.90	.92
2x12x2	.50	.68	.57	.60	4x 8x4	.48	.55	.54	.56
2x12x4	.56	.65	.63	.68	4x 8x6	.53	.63	.62	.64
2x12x6	.62	.72	.70	.74	4x10x4	.53	.63	.62	.64
2x14x2	.56	.65	.63	.68	4x12x4	.58	.72	.68	.73
2x14x4	.62	.72	.70	.74	4x12x6	.65	.77	.76	.78
2x14x6	.70	.78	.77	.80	4x14x4	.65	.77	.76	.78
3x 8x3	.44	.61	.50	.53	4x14x6	.69	.82	.81	.83
3x 8x6	.52	.61	.60	.63	4x14x8	.77	.90	.89	.91
3x10x2	.49	.59	.58	.60	4x16x4	.72	.88	.84	.87
3x10x6	.58	.69	.68	.70	4x16x6	.79	.93	.89	.92
3x12x3	.56	.67	.66	.68	4x16x8	.86	.98	.94	.97
3x12x6	.64	.73	.72	.74					

Sizes	2 1/2x1	2 1/2x1	3x1	3x1	3 1/2x1	4x1
6x 8x 6	\$0.63	\$0.78	\$0.68	\$0.90	\$1.06	\$1.22
6x10x 6	.70	.84	.84	1.05	1.16	1.32
6x12x 6	.80	1.00	.82	1.10	1.25	1.46
6x12x 9	.89	1.12	.91	1.22	1.42	1.60
6x14x 6	.88	1.10	.90	1.20	1.36	1.56
6x14x 8	.92	1.14	.94	1.26	1.47	1.68
6x14x10	.96	1.18	.98	1.32	1.58	1.80
6x16x 6	.92	1.14	.94	1.26	1.47	1.68
6x16x 8	.96	1.18	.98	1.32	1.58	1.80
6x16x10	1.00	1.22	1.02	1.38	1.69	1.92
8x 8x 8	.76	.92	.78	1.06	1.18	1.34
8x10x 8	.81	1.02	.83	1.12	1.26	1.48
8x12x 8	.89	1.12	.91	1.22	1.42	1.60
8x12x10		1.20	1.00	1.30	1.52	1.76
8x14x 8		1.28	1.08	1.40	1.66	1.88
8x14x10		1.32	1.12	1.44	1.74	2.02
8x16x 8		1.28	1.08	1.40	1.66	1.88
8x16x10		1.36	1.16	1.48	1.74	2.02
10x10x10	We have listed standard sizes.	1.12	.96	1.26	1.48	1.70
10x12x10		1.24	1.04	1.36	1.56	1.82
10x14x10		1.32	1.12	1.44	1.68	1.96
10x16x10		1.40	1.20	1.52	1.80	2.06

JOISTS AND WALL ANCHORS.



Type "A."



Type "C."



Type "D."



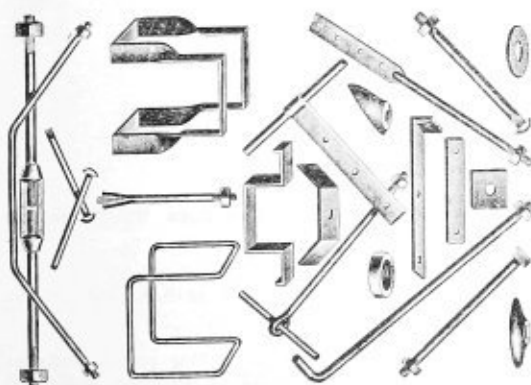
Type "B."



Type "E."

Prices Upon Application.

BUILDING AND CONSTRUCTION MATERIAL.



The above cuts show only a portion of the varieties of material that we manufacture for construction work, and we are prepared to do many other kinds of work to samples or drawings.

Will be pleased to submit prices upon receipt of specifications for any kind of forged work.

H.Channon Company. Chicago.

THE MARVEL HIGH SPEED DRAW CUT HACK SAW NO. 5

With Automatic Stock Feed

A development of the hack saw into an up-to-date machine tool. Concerns having quantities of duplicate pieces to cut will find this machine distinctly to their advantage in the immense saving in time and labor and in accuracy of work.

Some Tests Made

Here are a few samples of the cutting speed when using an ordinary hack saw blade: 1" Rd. steel $\frac{3}{4}$ min.; 2" Rd. 2-3 min.; 3" Rd. 5 min.; 4" Rd. 7 $\frac{1}{2}$ min.; 5" Rd. 13 min.; 6" Rd. 24 min.

Automatic Stock Feed

The stock feeding attachment raises the saw frame, opens the chuck, feeds the bar forward, closes chuck and starts a new cut in from 10 to 15 seconds.

The Saw Frame

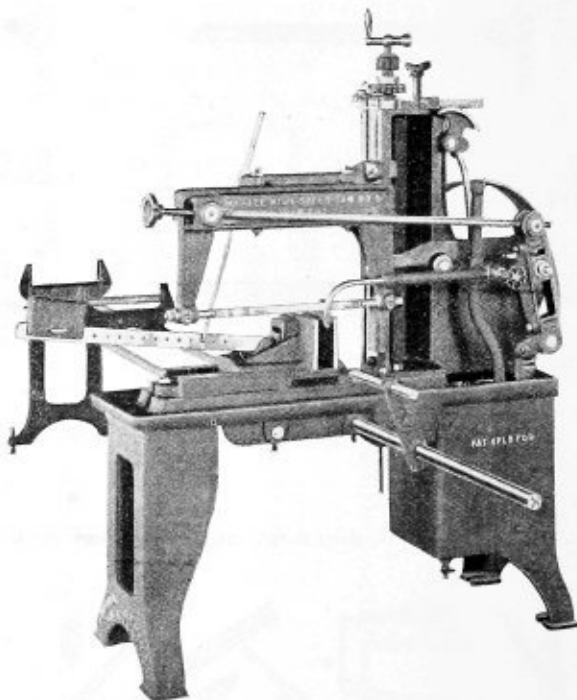
The saw frame always moves in a horizontal position, is actuated by the standard rocker arm which imparts a smooth, even cutting stroke to the saw blade, and gives a quick return.

Using up Entire Blade

The entire blade can be used up by shifting the saw frame by means of a right and left screw on the connecting rod.

The Swivel Chuck

The chuck has liberal dimensions, with jaws which extend out flush with saw blade, and is capable of taking eight inches. It can also be shifted forward or back and will swivel to either right or left for cutting on an angle.



Stops

In a slot in saddle in back of machine and easy of access are two dogs which may be instantly set to stop the cut at any desired depth.

Adjustable Stroke

The stroke can be changed from four to seven inches by means of shifting bolt in the crank.

The Pump

This machine is provided with the old reliable plunger pump with ball valves and has double air cushion chambers which gives a steady stream of compound on the saw blade. It is immersed in the bottom of the tank. Pump, pipe and all may be removed in five minutes.

Saw Pressure

Any desired pressure on saw blade during cutting stroke may be obtained by means of friction disc at top of screw.

Draw Cut

The saw cuts on the draw stroke and lifts free of the cut on the return.

This machine is also furnished without stock feed attachment.

Price \$140.00.

CIRCULAR SAWS.

When ordering, be particular to state whether Rip or Cross Cut is wanted, diameter of saw in inches, right or left hand, and size of mandrel hole.

Diameter Inches	Thickness, Gauge	Size of Hole, Inches	Price, Each	Extra for Each Gauge Heavier	Beveling New Saws, Per Gauge	Net Prices Extra for Setting and Sharpening If	
						Rip	Cross-Cut
1	24	3/8	\$	\$	\$	\$	\$
1 1/2	24	3/8					
2	23	3/8					
2 1/2	22	3/8					
3	21	1/2					
3 1/2	20	1/2					
4	19	5/8					
5	18	5/8					
6	18	5/8	1.80	.05	.13	.07	.10
7	18	5/8	2.10	.06	.20	.08	.11
8	18	5/8	2.40	.08	.22	.10	.13
9	17	7/8	2.80	.10	.25	.11	.14
10	16	1	3.30	.12	.28	.12	.16
11	16	1	3.90	.16	.30	.13	.18
12	15	1	4.40	.20	.35	.15	.20
14	14	1 1/8	5.30	.25	.40	.18	.23
16	14	1 1/8	6.50	.30	.50	.20	.25
18	13	1 1/8	8.00	.40	.60	.23	.28
20	13	1 3/8	9.50	.50	.70	.25	.32
22	12	1 3/8	11.50	.60	.80	.28	.35
24	11	1 3/8	13.50	.70	.90	.31	.40
26	11	1 3/8	16.00	.85	1.05	.35	.45
28	10	1 1/2	18.50	1.00	1.20	.38	.50
30	10	1 1/2	21.00	1.15	1.30	.42	.55
32	10	1 1/2	24.00	1.40	1.40	.45	.60
34	9	1 5/8	27.00	1.50	1.55	.50	.65
36	9	1 5/8	31.00	1.80	1.70	.55	.70
38	9	1 5/8	35.00	2.00	1.85	.60	.75
40	9	1 5/8	41.00	2.20	2.00	.65	.80
42	8	1 7/8	47.00	2.50	2.20		.85
44	8	1 7/8	55.00	3.00	2.40		.90
46	8	1 7/8	65.00	3.50	2.60		1.00
48	8	1 7/8	75.00	4.00	2.80		1.10
50	7	2	85.00	4.50	3.00		1.20
52	7	2	95.00	5.00	3.25		1.30
54	7	2	105.00	6.00	3.50		1.40
56	7	2	120.00	7.00	3.75		1.50
58	7	2	135.00	8.00	4.05		1.60
60	6	2 1/8	150.00	9.00	4.35		1.70
62	6	2 1/8	170.00	10.00	4.65		1.80
64	6	2 1/8	190.00	12.00	5.00		1.90
66	6	2 1/8	210.00	15.00	5.25		2.00
68	5	2 1/8	235.00	18.00	5.75		2.10
70	5	2 1/8	265.00	21.00	6.15		2.20
72	5	2 1/8	300.00	24.00	6.55		2.30
74	5	2 1/8	340.00	27.00	7.00		2.40
76	5	2 1/8	390.00	30.00	7.50		2.50
78	5	2 1/8	455.00	34.00	8.10		
80	5	2 1/8	550.00	38.00	8.80		
82	5	2 1/8	640.00	43.00	9.60		
84	5	2 1/8	730.00	48.00	10.50		

The above list cancels list shown on page 605.

All saws of odd diameter, not listed, take price of next larger size listed.

Saws from 1 to 5 inches in diameter are not carried in stock and only made at factory on special order.

No extra charge for Saws one gauge thicker than list.

No extra charge for Saws one or two gauges thinner than list; when more than two gauges thinner, add 5 per cent to list for each gauge.

Circular Saws 48 inches and larger, thinner than 10 gauge, are not warranted.

Circular Saws 42 inches or less in diameter beveled one gauge without extra charge; 44 inches or larger, beveled two gauges without extra charge.

Circular Saws hollow ground or concaved, add for each gauge hollow ground or concaved double the list for beveling.

CAST IRON HACK SAW FRAMES.

Cast iron, handsomely enameled. Made for 8-inch or 9-inch blades.

	Each	Dozen
For 8-inch blades.....	\$0.25	\$2.50
For 9-inch blades.....	.30	3.00
For 10-inch blades.....	.35	3.50
For 12-inch blades.....	.40	4.00

This list cancels list shown on page 599.

No. 10 EXTENSION HACK SAW FRAME.

Change adjustable to read "from 8 to 12 inches inclusive." Page 599.

GIANT HAND GRINDERS.

Page 612.

Change list price from \$15.00 to \$9.50 each.

H.Channon Company. Chicago.

CHANNON'S HAND, PANEL AND RIP SAWS OUR "STERLING" BRAND

Special Steel; Full Width Blade; Highly Polished; Full Skew Back; Polished Apple Handle;
Five Brass Screws; Fully Warranted

	Panel						Hand	Rip	
Length, inches...	14	16	18	20	22	24	26	28	30
Price, each....	\$ 1.00	\$ 1.10	\$ 1.20	\$ 1.40	\$ 1.60	\$ 1.70	\$ 1.80	\$ 2.15	\$ 2.50
Price, dozen....	10.00	11.00	12.00	14.00	16.00	17.00	18.00	21.25	25.00

OUR "HELMER" BRAND

Cast Steel; Skew Back; Beech Handle; Polished Edge; Four Brass Screws

	Panel						Hand	Rip	
Length, inches...	14	16	18	20	22	24	26	28	30
Price, each....	\$ 0.98	\$ 1.05	\$ 1.15	\$ 1.20	\$ 1.30	\$ 1.35	\$ 1.45	\$ 1.65	\$ 1.85
Price, dozen....	9.75	10.50	11.25	12.00	12.75	13.50	14.25	16.25	18.50

The above list cancels list shown on page 603.

KEYSTONE IRON FRAME GRINDSTONES For Power

No.	Diameter of Stone, inches	Thickness of Stone, inches	Size of Shaft at Bearings, inches	Price Each	
				Complete with Stone	Frame with Shaft, Pulley and Tool Rest
1	50	8	1 1/2	\$80.00	\$52.00
2	48	6	1 1/2	68.00	52.00
3	46	5	1 1/2	65.00	52.00
4	40	6	1 1/2	51.00	39.00
5	38	5	1 1/2	48.00	39.00
6	36	4 1/2	1 1/2	46.00	39.00
7	30	4	1	38.00	33.00
8	30	3	1	36.50	33.00

The above list cancels list shown on page 616.

WOODEN FRAME GRINDSTONES For Power

No.	Size of Stone, inches	Price of Frame	Frame and Shaft	Complete with Stone
5	24x3	\$ 8.00	\$21.00	\$23.00
6	30x4	10.00	23.00	28.00
7	36x4 1/2	11.00	25.50	32.00
8	42x5	12.00	27.00	38.00
9	48x6	13.50	33.00	50.00
10	54x7	17.50	41.00	67.00
11	60x8	24.00	48.00	84.00

This list cancels list shown on page 616.

HERCULES MOUNTED GRINDSTONE

Size, No.	Diameter, inches	Thickness, inches	Stone weighs about, lbs.	Price Complete, Each
1	24	2	80	\$ 8.00
2	24	3	120	9.00
4	26	3	140	10.00
5	28	3	165	11.00
7	30	3	185	12.00
10	34	3	240	14.00

The above list cancels the list on page 618.

WROUGHT IRON TURNBUCKLES.

For complete list see page 625.
Change price lists on the following sizes:

Diameter	Price Each	Black	Galvanized
Screw, inches			
3/8		\$0.70	\$0.80
1/2		.75	.85

HINGE HASPS. PAGE 629.

Wrought Iron.

Change list price on 3 inch from \$0.35 to \$0.50 per dozen.

LOCK WASHERS. Page 643

Nut Locks

Cut in Catalog of National Pattern Is Wrong. Cut Shown Below Is Correct.



Corrections on Lock Washer List on page 643.

Change first bolt size from 3/4" to 1/2".

BIFURCATED OR CLINCH RIVETS.

Price listed is per thousand rivets.
PAGE 647.

GOLD METAL DRILL ROD.

Change list price on sizes 3/4 inch to 33-64 inch, inclusive, from 55c to 60c per lb.

Change list price on sizes 3/4 inch up to inch diameter by 64ths of an inch from 50c to 60c per lb. Page 651.

WROUGHT IRON WASHERS

Manufacturers' Standard List

In 200 lb. kegs.

Diam., inches	Hole, inches	Thickness of Wire Gauge, Number	Bolt, inches	Price per lb. in Cts.	Approximate Number in keg	Diam., inches	Hole, inches	Thickness of Wire Gauge, Number	Bolt, inches	Price per lb. in Cts.	Approximate Number in keg
$\frac{1}{2}$	$\frac{1}{4}$	18	$\frac{1}{2}$	14.	78,800	$\frac{3}{4}$	$\frac{1}{2}$	9	1	9.	1,250
$\frac{3}{4}$	$\frac{1}{2}$	16	$\frac{3}{4}$	12.2	31,200	$\frac{1}{2}$	$\frac{1}{4}$	11	$\frac{1}{4}$	9.	1,040
$\frac{1}{2}$	$\frac{3}{8}$	16	$\frac{1}{2}$	11.4	22,500	$\frac{3}{4}$	$\frac{1}{2}$	9	$\frac{1}{4}$	9.2	800
$\frac{3}{4}$	$\frac{1}{2}$	14	$\frac{3}{4}$	10.5	13,600	$\frac{1}{2}$	$\frac{1}{4}$	8	$\frac{1}{4}$	9.2	600
$\frac{1}{2}$	$\frac{3}{8}$	14	$\frac{1}{2}$	9.8	8,600	$\frac{3}{4}$	$\frac{1}{2}$	8	$\frac{1}{4}$	9.2	560
$\frac{3}{4}$	$\frac{1}{2}$	12	$\frac{3}{4}$	9.4	5,200	$\frac{1}{2}$	$\frac{1}{4}$	8	$\frac{1}{4}$	9.5	480
$\frac{1}{2}$	$\frac{3}{8}$	12	$\frac{1}{2}$	9.3	4,500	$\frac{3}{4}$	$\frac{1}{2}$	8	$\frac{1}{4}$	9.5	430
$\frac{3}{4}$	$\frac{1}{2}$	10	$\frac{3}{4}$	9.2	2,600	$\frac{1}{2}$	$\frac{1}{4}$	8	$\frac{1}{4}$	9.5	380
$\frac{1}{2}$	$\frac{3}{8}$	10	$\frac{1}{2}$	9.1	2,010	$\frac{3}{4}$	$\frac{1}{2}$	8	$\frac{1}{4}$	9.5	350
$\frac{3}{4}$	$\frac{1}{2}$	9	$\frac{3}{4}$	9.	1,720						

Advances: For less than Key lots (200 lbs.) of one size, add 20c per cwt. for 100 lbs. or over; 50 per cwt. for less than 100 lbs.

The above list cancels list now on page 643.

SWEDEN IRON BURRS

PRICE PER POUND

No.	Black	Tinned	No.	Black	Tinned	No.	Black	Tinned
$\frac{1}{2}$	\$0.36	\$0.52	4	\$0.37	\$0.53	9	\$0.45	\$0.61
$\frac{3}{4}$	.36	.52	5 or $\frac{1}{2}$	.38	.54	10	.47	.63
1	.36	.52	6	.42	.58	11 or $\frac{1}{2}$	.50	.66
2 or $\frac{3}{2}$	.36	.52	$\frac{1}{2}$	.42	.58	12	.60	.76
3	.36	.52	7	.43	.59	13 or $\frac{1}{2}$	.70	.86
$\frac{1}{2}$	.36	.52	8 or $\frac{1}{2}$	.44	.60	14	.80	.96

This list cancels list shown on page 648.

DROP-FORGED MACHINE HANDLES

Ball Pattern

Specifications for Finished Handles

No.	Extreme Length	Length of Shank	Diameter of Shank Rough Forged	Diameter of Shank Finished
00				
0				
1	$2\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
2	$3\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
3	$3\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
4	$3\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
5	$4\frac{1}{2}$	$3\frac{1}{2}$	1	1
6	$4\frac{1}{2}$	$3\frac{1}{2}$	1	1
7	$4\frac{1}{2}$	$3\frac{1}{2}$	1	1

For price list and sizes, "unfinished," see page 646.

McCHESNEY STEEL WIRE HOSE BANDS AND HOSE CLAMPING TOOL

No.	Size Hose, Inches	Gauge of Wire	No. in Box	Price Per 1,000
00	$\frac{1}{4}$ - $\frac{3}{8}$	15	100	\$ 15.00
0	$\frac{1}{2}$ - $\frac{3}{4}$	15	100	16.00
1	1	13	100	30.30
2	$1\frac{1}{2}$ -2	12	100	45.00
3	2-3	11	50	60.00
4	3-4	11	50	75.00
5	4-5	10	50	90.00
6	5-6	10	50	105.00

Hose Clamping Tool, each.....\$5.00
The above list cancels list shown on page 683.

BELT PUNCHES.

Solid Tool Steel, Drilled and Reamed.

No.	Price, Per Dozen	Price, Each
1, 2, 3, 4, 5, 6.....	\$2.00	\$0.20
7, 8, 9.....	2.25	.25
10, 11, 12.....	3.25	.35
13, 14.....	5.25	.55
15, 16.....	5.50	.55

This list cancels list shown on page 671.

BELTING AND PACKING SHEARS.

No.	Length Over All, Inches	Price, Each
1	8 $\frac{1}{2}$	\$1.50
2	11	2.00

This list corrects list shown on page 671.

TWENTIETH CENTURY DISKS.

For complete list see page 693.
Size, Inches

Each	Price
3	\$0.40
4	.60
6	1.00

This corrects price list, page 693.

ZINC CAN-SCREWS.

Size	No.	Price, per Gross
$\frac{1}{4}$	1	\$ 4.00
$\frac{3}{8}$	2	4.50
$\frac{1}{2}$	3	6.00
$\frac{3}{4}$	4	8.00
$1\frac{1}{4}$	5	12.00
$1\frac{1}{2}$	6	16.00
$1\frac{3}{4}$	7	20.00
2		

PAGE 699.

H.Channon Company. Chicago.

REGULAR RUBBER BELT LIST. Price per Foot.

Inch	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
1	\$0.09	\$0.11	\$0.13				
1 1/4	.11	.13	.16				
1 1/2	.13	.15	.19	\$0.23			
1 3/4	.15	.17	.22	.27			
2	.18	.20	.25	.31	\$0.37		
2 1/4	.22	.25	.31	.38	.46		
2 1/2	.25	.30	.37	.45	.55		
3	.30	.35	.43	.53	.65		
3 1/4	.34	.40	.50	.61	.75	\$0.86	
3 1/2	.38	.45	.55	.69	.84	.96	
4	.42	.50	.61	.76	.91	1.06	
4 1/2	.50	.60	.72	.89	1.08	1.25	\$1.44
5	.59	.70	.84	1.04	1.25	1.46	1.68
6	.67	.80	.96	1.19	1.44	1.68	1.92
7	.76	.90	1.07	1.34	1.60	1.88	2.16
8	.84	1.00	1.20	1.49	1.77	2.09	2.40
9	.92	1.10	1.32	1.63	1.96	2.29	2.62
10	1.00	1.20	1.43	1.78	2.15	2.50	2.85
11	1.10	1.30	1.56	1.95	2.34	2.73	3.12
12	1.19	1.40	1.69	2.11	2.54	2.96	3.39
13	1.28	1.52	1.83	2.28	2.74	3.19	3.65
14	1.37	1.65	1.96	2.44	2.94	3.42	3.92
15	1.55	1.87	2.22	2.77	3.33	3.88	4.44
16	1.74	2.09	2.49	3.10	3.72	4.35	4.97
17	1.94	2.33	2.77	3.47	4.16	4.85	5.54
18	2.16	2.60	3.08	3.85	4.62	5.39	6.16
19	2.38	2.86	3.39	4.23	5.08	5.93	6.78
20	2.60	3.12	3.70	4.62	5.54	6.47	7.39
21	2.82	3.39	4.00	5.00	6.00	7.00	8.00
22	3.04	3.65	4.31	5.39	6.47	7.55	8.62
23	3.26	3.93	4.62	5.78	6.93	8.09	9.24
24	3.48	4.18	4.92	6.16	7.39	8.62	9.86
25	3.70	4.44	5.24	6.55	7.85	9.16	10.47
26	3.92	4.71	5.55	6.93	8.32	9.70	11.09
27	4.14	4.97	5.85	7.32	8.78	10.24	11.70
28	4.36	5.24	6.16	7.70	9.24	10.78	12.32
29	4.58	5.50	6.47	8.08	9.70	11.32	12.94
30	4.80	5.76	6.73	8.47	10.16	11.86	13.55
31	5.02	6.02	7.08	8.85	10.63	12.40	14.17
32	5.22	6.29	7.39	9.24	11.09	12.94	14.78
33	5.46	6.56	7.70	9.63	11.55	13.48	15.40
34	5.68	6.82	8.01	10.01	12.01	14.01	16.02
35	5.90	7.08	8.32	10.40	12.47	14.55	16.63
36	6.12	7.36	8.62	10.78	12.94	15.09	17.25

This list cancels list shown on page 663.

STEAM HOSE

Price per Foot

Internal Diameter, inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply	Internal Diameter, inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
1/2	\$0.47	\$0.56	\$0.70	\$0.84	\$0.98	\$1.12	1 1/2	\$1.02	\$1.25	\$1.56	\$1.87	\$2.18	\$2.50
3/4	.57	.71	.87	1.05	1.23	1.41	2	1.34	1.66	2.07	2.49	2.90	3.32
1	.70	.87	1.07	1.28	1.50	1.70	2 1/2	1.50	1.87	2.33	2.80	3.27	3.74
1 1/4	.85	1.04	1.30	1.56	1.82	2.08	3	1.66	2.08	2.60	3.12	3.64	4.16

This list cancels list shown on page 674.

AIR DRILL HOSE PRICE LIST

Price, Per Foot

Internal Diameter, inches	3-Ply, 2-Ply Inside, 1-Ply Outside	4-Ply, 3-Ply Inside, 1-Ply Outside	5-Ply, 4-Ply Inside, 1-Ply Outside	6-Ply, 5-Ply Inside, 1-Ply Outside
1/2	\$0.47	\$0.56	\$0.70	\$0.84
3/4	.57	.71	.87	1.05
1	.70	.87	1.07	1.28
1 1/4	.85	1.04	1.30	1.56
1 1/2	1.02	1.25	1.56	1.87

This list cancels list shown on page 675.

MILL HOSE.

Cotton, Rubber-Lined.

Diameter, Inches	Price, per Foot, 50-Ft. Lengths
1	\$0.40
1 1/4	.45
1 1/2	.50
2	.65
2 1/4	.80

This list cancels list shown on page 680.

WE ARE MANUFACTURER'S AGENTS FOR THE NEW YORK RUBBER CO.

Additional Line of Lanterns to Those Shown
on Page 708.

THE NEW DIETZ DASH LAMP.



"Cold Blast" construction. Japanned black. Has white bull's eye globe and ruby bull's eye in center of rear reflector. Side lever for raising and lowering globe. Fount holds oil to burn 13 hours.

Each, net\$1.00
Dozen, net 9.50

LANTERN GLOBES

Globe No.	For Lanterns Suitable	White		Green or Blue		Red	
		Each	Doz.	Each	Doz.	Each	Doz.
0	No. 0&2 Tubular	\$0.10	\$0.90	\$0.35	\$3.50	\$0.50	\$ 5.00
0	No. 1&2 Cold Blast	.15	1.20	.40	4.00	.55	5.50
0	Bull's Eye	.20	1.92				
39	No. 39 Cold Blast	.20	2.00	.40	4.00	.55	5.50
39	R.R. Standard	.15	1.50	.50	5.00	.65	6.50
39	R.R. Flint	.30	3.00	.80	8.00	1.20	12.00

The above list cancels list shown on page 708.

HOT BLAST, COLD BLAST AND MILL LANTERNS.

Change list on No. 2 Mill to Each \$2.40.
Dozen, \$24.00.

This cancels list on above No. page 708.

PLAIN GREASE CUPS, STEEL OR BRASS.

Change length "Shank Pipe Thread, inches" to read on, No. "0" $\frac{1}{4}$, on No. 2 $\frac{3}{8}$, on No. 3 $\frac{1}{2}$. Page 726.

LEPAGE'S LIQUID GLUE.

In Bottles, for Family Use.

Half gills, three dozen in case.....per doz. \$1.66
Gills, three dozen in case.....per doz. 2.20

CARRIAGE GLUE, IN TIN CANS.

For Mechanics, Etc.

Half pint, two dozen in a case.....per doz. \$ 3.25
One pint, one dozen in a case.....per doz. 5.40
One quart, one dozen in a case.....per doz. 9.50
Half gallon, one-half dozen in case.....per doz. 18.50
One gallon, one-half dozen in case.....per doz. 36.00
Five gallon cans, boxed.....per gal. 2.80

This list cancels list on page 710.

SPECIAL IDEAL SELF-FEED ROLLER TUBE EXPANDER

Diam., Inches	Price Each	Diam., Inches	Price Each	Diam., Inches	Price Each
1	16.00	2	16.00	3	22.00
1 $\frac{1}{4}$	16.00	2 $\frac{1}{4}$	18.00	3 $\frac{1}{4}$	24.50
1 $\frac{1}{2}$	16.00	2 $\frac{1}{2}$	18.00	3 $\frac{1}{2}$	24.50
1 $\frac{3}{4}$	16.00	2 $\frac{3}{4}$	19.50	3 $\frac{3}{4}$	27.00
2	16.00	3	22.00	4	27.00

This list cancels list on page 735.

STANDARD, IRON BODY, BRASS MOUNTED GATE VALVES.

For complete specifications see list on page 747.

Change list price on 4 $\frac{1}{2}$ inch size from \$20.00 to \$23.00.

AMERICAN EJECTORS.

Page 741.

Change list price on No. 9 from \$175.00 to \$90.00.

POLL PICKS FIG. 39

Weight, Pounds	Price Each	Price per Dozen
3 $\frac{1}{4}$	\$1.50	\$15.00
4 $\frac{1}{2}$	1.70	17.00

This list cancels list on page 782.

MINING PICK HANDLES.

Change length on "Drifting" from 24 inches to 34 inches. Page 783.

We Carry A Large And Well Assorted Stock Of Contractors' Hand Tools

DISCS FOR JENKINS VALVES

Size	Price Each	Size	Price Each	Size	Price Each	Size	Price Each
1	\$0.03	3	\$0.18	5	\$0.80	14	\$3.50
1 1/2	.04	2 1/2	.24	6	1.00	16	4.00
1 1/4	.04	3	.40	7	1.20	18	5.00
1 1/2	.05	3 1/2	.50	8	1.40	20	6.00
1 3/4	.06	4	.60	9	1.80	22	7.50
1 1/2	.09	4 1/2	.70	10	2.25	24	9.00
1 3/4	.12			12	2.50		

This list cancels list on page 745.

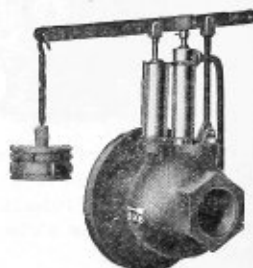
PRESSURE REGULATORS.



No. 1



No. 2



No. 3

The above cuts are correct; those on page 751 are wrong.

JOHNSON WRECKING FROGS OR CAR REPLACERS

Types Z, A or B,
Left Hand.

It straddles the rail. Both front and rear parts rest on the rail. It forms a friction grip with the rails and needs no spikes, clamps or fasteners. It distributes the load on the entire rail, not on one or two ties. Fits all sections of T-rail from six-inch down.

Types C and M,
Right Hand.

Range	T Rail	Capacity	Throat Opening	Weight each, lbs.	Price per Pair
Type M for rail 12 to 45 lbs. if not over 3½ in. high.	20 ton locomotive.....	2 inches	30	\$15.00	
Type C for rail up to 65 lbs. if not over 4½ in. high.	30 ton locomotive.....	2½ inches	60	18.75	
Type B for rail up to 80 lbs. if not over 5 in. high.	50 ton locomotive.....	3 inches	110	22.00	
Type A for rail up to 100 lbs. if not over 5½ in. high.	80 ton locomotive.....	3½ inches	145	27.50	
Type Z for rail up to 100 lbs. if not over 6 in. high.	100 ton locomotive.....	3¾ inches	165	40.00	
Type AA for rail up to 100 lbs. if not over 6 in. high.	200 ton wreck outfit.....	3½ inches	275	50.00	

For General Use on All Machinery Bearings

USE ONOKO BABBITT METAL

It Runs Uniform, Smooth and Cool.

NEW LIST

May 28, 1910

WIDE COTTON DUCK

Nos.	1-0	1	2	3	4	5	6	Nos.	7	8	9	10	11	12	Nos.
26 in.	...57	...54	...51	...48	...45	...42	...39	26 in.	...37	...35	...31	...29	...26	...24	26 in.
28 in.	...61	...58	...55	...51	...48	...45	...42	28 in.	...40	...37	...33	...31	...28	...26	28 in.
30 in.	...65	...62	...58	...55	...52	...48	...45	30 in.	...43	...40	...36	...33	...30	...28	30 in.
32 in.	...70	...66	...62	...59	...55	...51	...48	32 in.	...45	...42	...39	...36	...32	...30	32 in.
34 in.	...74	...70	...66	...62	...58	...55	...51	34 in.	...48	...45	...41	...38	...34	...32	34 in.
36 in.	...78	...74	...70	...66	...62	...58	...54	36 in.	...51	...48	...43	...40	...36	...33	36 in.
38 in.	...83	...78	...74	...70	...66	...61	...57	38 in.	...54	...50	...46	...42	...38	...35	38 in.
40 in.	...87	...82	...78	...73	...69	...64	...60	40 in.	...56	...53	...48	...44	...40	...37	40 in.
42 in.	...91	...86	...82	...77	...72	...67	...63	42 in.	...59	...56	...51	...47	...42	...39	42 in.
44 in.	...95	...90	...85	...80	...75	...70	...65	44 in.	...62	...58	...53	...49	...44	...41	44 in.
46 in.	1.00	...95	...89	...84	...79	...74	...68	46 in.	...65	...61	...55	...51	...46	...43	46 in.
48 in.	1.04	...99	...93	...88	...82	...77	...71	48 in.	...68	...63	...58	...53	...48	...44	48 in.
50 in.	1.08	1.03	...97	...91	...86	...80	...74	50 in.	...70	...66	...60	...55	...50	...46	50 in.
52 in.	1.13	1.07	1.01	...95	...89	...83	...77	52 in.	...73	...69	...63	...58	...52	...48	52 in.
54 in.	1.17	1.11	1.05	...99	...93	...86	...80	54 in.	...76	...71	...65	...60	...54	...50	54 in.
56 in.	1.21	1.15	1.09	1.02	...96	...90	...83	56 in.	...79	...74	...67	...62	...56	...52	56 in.
58 in.	1.26	1.19	1.13	1.06	...99	...93	...86	58 in.	...82	...77	...70	...64	...58	...54	58 in.
60 in.	1.33	1.26	1.19	1.12	1.05	...98	...91	60 in.	...86	...81	...74	...68	...62	...56	60 in.
62 in.	1.38	1.30	1.23	1.16	1.09	1.02	...94	62 in.	...89	...84	...76	...70	...64	...58	62 in.
64 in.	1.42	1.35	1.29	1.20	1.12	1.05	...97	64 in.	...92	...86	...79	...72	...66	...60	64 in.
66 in.	1.47	1.39	1.31	1.23	1.16	1.08	1.00	66 in.	...95	...89	...81	...75	...68	...62	66 in.
68 in.	1.51	1.43	1.35	1.27	1.19	1.11	1.03	68 in.	...98	...92	...84	...77	...70	...64	68 in.
70 in.	1.55	1.48	1.39	1.31	1.23	1.15	1.06	70 in.	1.01	...95	...86	...79	...72	...66	70 in.
72 in.	1.64	1.55	1.47	1.38	1.30	1.21	1.12	72 in.	1.06	1.00	...90	...83	...76	...69	72 in.
74 in.	1.68	1.59	1.51	1.42	1.33	1.24	1.15	74 in.	1.09	1.02	...93	...86	...78	...71	74 in.
76 in.	1.73	1.64	1.55	1.46	1.37	1.27	1.18	76 in.	1.12	1.05	...95	...88	...80	...73	76 in.
78 in.	1.77	1.68	1.59	1.49	1.40	1.31	1.21	78 in.	1.15	1.08	...98	...90	...82	...75	78 in.
80 in.	1.82	1.72	1.63	1.53	1.44	1.34	1.25	80 in.	1.18	1.10	1.00	...93	...84	...77	80 in.
82 in.	1.86	1.77	1.67	1.57	1.47	1.38	1.28	82 in.	1.21	1.13	1.03	...95	...86	...79	82 in.
84 in.	2.00	1.89	1.79	1.68	1.58	1.47	1.37	84 in.	1.29	1.21	1.10	1.01	...92	...84	84 in.
86 in.	2.14	2.03	1.92	1.80	1.69	1.58	1.47	86 in.	1.38	1.29	1.18	1.08	...98	...89	86 in.
88 in.	2.19	2.08	1.96	1.84	1.73	1.62	1.50	88 in.	1.41	1.32	1.20	1.11	1.00	...92	88 in.
90 in.	2.24	2.12	2.00	1.89	1.77	1.65	1.53	90 in.	1.45	1.35	1.23	1.13	1.03	...94	90 in.
92 in.	2.29	2.17	2.05	1.93	1.81	1.69	1.57	92 in.	1.48	1.38	1.26	1.16	1.05	...96	92 in.
94 in.	2.49	2.36	2.23	2.10	1.98	1.84	1.71	94 in.	1.61	1.50	1.37	1.25	1.14	1.03	94 in.
96 in.	2.54	2.41	2.28	2.14	2.01	1.88	1.74	96 in.	1.64	1.53	1.40	1.28	1.16	1.05	96 in.
98 in.	2.65	2.51	2.37	2.23	2.09	1.95	1.81	98 in.	1.71	1.60	1.45	1.33	1.21	1.10	98 in.
100 in.	2.70	2.56	2.42	2.28	2.14	1.99	1.85	100 in.	1.74	1.63	1.48	1.36	1.23	1.12	100 in.
102 in.	2.76	2.61	2.47	2.32	2.18	2.03	1.89	102 in.	1.78	1.66	1.51	1.39	1.26	1.14	102 in.
104 in.	2.81	2.66	2.52	2.37	2.22	2.07	1.93	104 in.	1.81	1.70	1.54	1.41	1.28	1.16	104 in.
106 in.	2.87	2.72	2.56	2.41	2.26	2.11	1.96	106 in.	1.85	1.73	1.57	1.44	1.31	1.19	106 in.
108 in.	2.92	2.77	2.61	2.46	2.31	2.15	2.00	108 in.	1.88	1.76	1.60	1.47	1.33	1.21	108 in.
110 in.	2.97	2.82	2.66	2.50	2.35	2.19	2.04	110 in.	1.92	1.79	1.63	1.50	1.35	1.23	110 in.
112 in.	3.03	2.87	2.71	2.55	2.39	2.23	2.07	112 in.	1.95	1.83	1.66	1.52	1.38	1.25	112 in.
114 in.	3.08	2.92	2.76	2.60	2.43	2.27	2.11	114 in.	1.99	1.86	1.69	1.55	1.40	1.28	114 in.
120 in.	3.26	3.07	2.90	2.73	2.56	2.39	2.22	120 in.	2.09	1.95	1.78	1.63	1.48	1.34	120 in.

This cancels list shown on page 883.

WOODBURY YACHT DUCK.

8-oz., 28½-in.	...\$0.20	10-oz., 28½-in.	...\$0.25
9-oz., 28½-in.	...22½	12-oz., 28½-in.	...30½
15-oz., 28½-in.	...\$0.39		

This list cancels list on lower right-hand corner, page 883.

UNITED STATES ARMY DUCK.

7-oz., 28½-in.	...\$0.17	10-oz., 28½-in.	...\$0.24
8-oz., 28½-in.	...19	12-oz., 28½-in.	...28½
9-oz., 28½-in.	...21½	15-oz., 28½-in.	...36

This list cancels list on lower left-hand corner, page 883.

MOGUL STOVES.

Cuts shown on page 837 are incorrect.

These stoves are made from new patterns and are superior in design and finish to any stoves of their class on the market.

All castings made entirely from new grey iron—no scrap iron being used in any portion of the stoves.

Will burn hard or soft coal, wood or natural gas. All stoves furnished with ash pan, shaking and dumping grate, lever, shelf and damper without extra charge.

REGULAR PATTERN.

For general use as a station stove for railroads, or for general heating, as in construction sheds, riggers and tool houses, etc., strictly first-class throughout.

We are prepared to furnish sheet-iron drums, water bowls and attachments for bolting to floor at low prices.

CABOOSE PATTERN.

Regularly furnished with fastenings for door and ash pan and lugs for bolting to floor of caboose. Has ash pan, shaking and dumping grate, lever, shelf and damper furnished without extra charge. In every respect equal to any stove made.



Round Top Regular Pattern.



Flat Top Caboose Pattern.

No.	Diameter, Inches	Height, Inches	Weight, Pounds	Net Price, Each	
				Regular	Caboose
1	15	40	300	\$13.00	\$15.00
2	17	45	350	15.00	17.00
3	19	50	450	19.00	21.00

Both patterns furnished with round or flat tops—round tops sent unless otherwise specified.

COTTON SAIL DUCK.

No.	22-inch \$0.47	24-inch \$0.51
0	.44	.48
1	.42	.46
2	.40	.43
3	.37	.41
4	.35	.38
5	.33	.36
6	.31	.34
7	.30	.33
8	.29	.32
9	.28	.30
10	.26	.29
11	.25	.27
12	.23	.25

This list cancels list on upper left-hand corner, page 884.

NARROW DUCK, OVER 12 INCHES

No	14-inch*	16-inch	18-inch	20-inch
00	\$0.31	\$0.35	\$0.39	\$0.43
0	.29	.33	.37	.41
1	.28	.31	.35	.39
2	.26	.30	.33	.37
3	.25	.28	.31	.35
4	.24	.26	.29	.33
5	.23	.25	.28	.31
6	.22	.24	.26	.29
7	.21	.23	.25	.28
8	.20	.22	.24	.27
9	.19	.21	.23	.26
10	.18	.20	.22	.24
11	.17	.19	.21	.23
12	.16	.18	.20	.22

This list cancels list on page 884.

HEAVY NAUGHT DUCK.

No.	22-inch	24-inch
3-0	\$0.50	\$0.54
4-0	.52	.57
5-0	.55	.60
6-0	.58	.63
8-0	.62	.67
10-0	.67	.73
12-0	.71	.78

This list cancels list on page 884.

HEAVY NARROW DUCK, OVER 12 INCHES

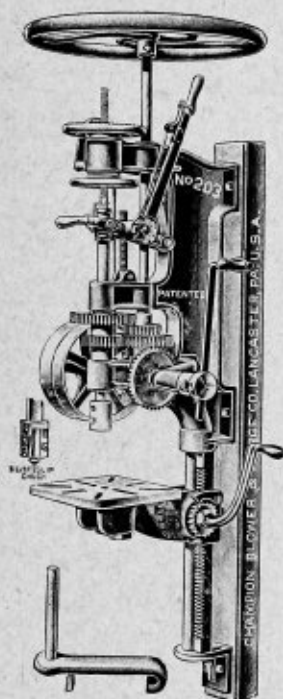
No.	14-inch	16-inch	18-inch	20-inch
3-0	\$0.33	\$0.37	\$0.41	\$0.45
4-0	.35	.39	.43	.48
5-0	.37	.42	.46	.51
6-0	.40	.44	.48	.53
8-0	.44	.48	.52	.57
10-0	.48	.51	.56	.61
12-0	.52	.56	.60	.65

Corrects list shown on page 884.

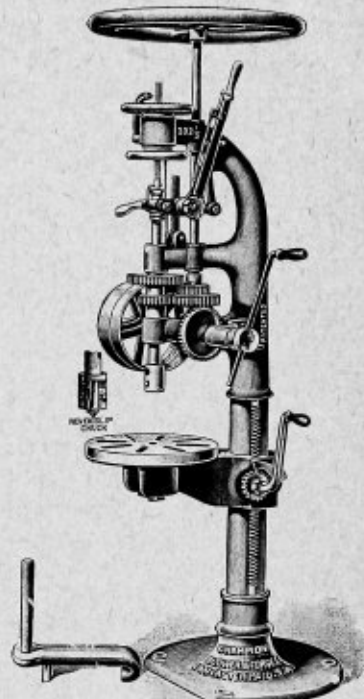
For Hard Service Use AJAX ROPE. Strong, Safe and Economical.

Additional line of Champion Drills, see page 816 for regular line.

CHAMPION AUTOMATIC SELF-FEED AND LEVER-FEED DRILLS.



No. 203.



No. 203 1/2.

Above cuts show improved double compound lever feed now supplied on all No. 203 and No. 203 1/2 Champion Drills.

No. 203 has machine cut, double sliding back gears for light or heavy work. Workmanship is the very best. Fly-wheel spins on ball bearings at bottom end of shaft, and end friction is taken from spindle by the use of ball-bearings, making the drill light running and strictly up-to-date. The self-feed is the latest design and gives drill bit ample cutting clearance. Adjusting lever can be changed to suit work being done and changing drill from self-feed to lever-feed is accomplished in a fraction of a second. Is equipped with rack for raising and lowering table and wheel hangers for drilling tires.

No. 203 1/2 is a strictly first-class, up-to-date power and hand drill, practical for machine, black-smith and carriage shops. Has double back cut gears, exactly the same as No. 203, the difference in these drills being that the No. 203 1/2 is an upright drill and requires no post. Workmanship and material are the very best. Fly-wheel spins on ball-bearings and friction in spindle is overcome by the use of ball-bearings, making it a perfect running drill. Self-feed is the latest design and lever is adjustable. Has rack for raising and lowering table and wheel hangers for drilling tires.

No.	Drilling Circle inches	Diameter Spindle, inches	Up and Down Run, inches	Bored for S. S. Bits, inches	Drills, Holes, Size, inches	Weight, pounds	Price with T. and L. Pulleys	Price with Cone Pulleys and Counter Shafts
203	21	1 1/2	5 1/2	1 1/2 (Coe's)	up to 1 1/2	400	\$54.00	\$65.00
203 1/2	21	1 1/2	5 1/2	1 1/2 (Coe's)	up to 1 1/2	600	75.00	85.00

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